Series 1960, No. 14 Issued June 1964

SOIL SURVEY

Iredell County North Carolina

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
In cooperation with
NORTH CAROLINA AGRICULTURAL EXPERIMENT STATION

HOW TO USE THE SOIL SURVEY REPORT

THIS SOIL SURVEY of Iredell County, N.C., will serve several groups of readers. It will help farmers in planning the kind of management that will protect their soils and provide good yields; assist engineers in selecting sites for roads, buildings, ponds, and other structures; aid foresters in managing woodlands; and add to our knowledge of soil science. The survey will also help in rural planning and land appraisal and will assist buyers in selecting the proper soil for the intended use.

Locating soils

Use the index to map sheets at the back of this report to locate areas on the large map. The index is a small map of the county on which numbered rectangles have been drawn to show where each sheet of the large map is located. When the correct sheet of the large map has been found, it will be seen that boundaries of the soils are outlined, and that there is a symbol for each kind of soil. All areas marked with the same symbol are the same kind of soil, wherever they occur on the map. The symbol is inside the area if there is enough room; otherwise, it is outside the area and a pointer shows where the symbol belongs.

Finding information

This report contains sections that will interest different groups of readers, as well as some sections that may be of interest to all.

Farmers and those who work with farmers can learn about the soils in the section "Descriptions of the Soils" and then turn to the section "Use and Management of the Soils." In this way, they first identify the soils on their farm and then learn how these soils can be managed and what yields can be expected. The "Guide to Mapping Units" at the back of the report will simplify use of the map and report. This guide lists each soil and land type mapped in the county and the page where each is described. It also lists, for each soil and land type, the capability unit and woodland suitability group, and the pages where each of these is described.

Foresters and others interested in woodland can refer to the section "Woodland Uses of the Soils." In that section the soils in the county are grouped according to their suitability for trees and factors affecting the management of woodland are explained.

Engineers will want to refer to the section "Engineering Uses of the Soils." Tables in that section show characteristics of the soils that affect engineering.

Scientists and others who are interested will find information about how the soils were formed and how they were classified in the section "Formation and Classification of Soils."

Students, teachers, and other users will find information about soils and their management in various parts of the report, depending on their particular interest.

Newcomers in Iredell County will be especially interested in the section "General Soil Map," where broad patterns of soils are described. They also may be interested in the section "General Nature of the County," which gives additional information about the county.

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Fieldwork for this survey was completed in 1960. Unless otherwise indicated, all statements in the report refer to conditions in the county at that time. This soil survey of Iredell County was made cooperatively by the North Carolina Agricultural Experiment Station and the Soil Conservation Service. The contribution of the Soil Conservation Service was part of the technical assistance furnished to the Middle Yadkin Soil Conservation District, which was organized in March 1939.

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SOIL SURVEY OF IREDELL COUNTY, NORTH CAROLINA

REPORT BY JOEL W. CAWTHORN AND V. S. JENKINS

SOILS SURVEYED BY JOEL W. CAWTHORN, V. S. JENKINS, C. M. McCACHREN, D. A. COMPTON, E. O. BREWER, J. L. ZIMMERMAN, AND E. H. KARNOWSKI, SOIL CONSERVATION SERVICE, AND J. M. SOILEAU AND D. L. KASTER, NORTH CAROLINA AGRICULTURAL EXPERIMENT STATION

UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, IN COOPERATION WITH THE NORTH CAROLINA AGRICULTURAL EXPERIMENT STATION

IREDELL COUNTY is in the upper Piedmont Plateau of North Carolina in the west-central part of the State (fig. 1). Statesville, the county seat, is 125 miles west of Raleigh, the State capital, and 40 miles north of Charlotte, the largest city in the State. It is 200 miles northwest of the port city of Wilmington, N.C.

Many industries are located in the county. Most of them are nonagricultural.

The county has a land area of 378,240 acres, or 591 square miles. An additional 3 square miles, or 1,920 acres, is under water. The climate is warm temperate. Rainfall is generally sufficient for the crops that are grown, but short periods of drought are common in summer. Most of the area is in farms. The farms are mostly operated by the owner, but many farmers work at other jobs and operate their farms part time.

Farming has always been a leading occupation. The soils are mostly red, deep, and easy to till. Most of them are gently sloping, but they range from nearly level to steep. Crops grown on the soils respond well if good management is used. Dairying is the chief type of farming, and the raising of poultry is next. Lespedeza, alfalfa, corn, oats, wheat, barley, cotton, tobacco, and soybeans are the main crops. Truck crops are grown in some parts of the county, and trees are becoming increasingly important as a crop in many parts.

How Soils Are Named, Mapped, and Classified

Soil scientists made this survey to learn what kinds of soils are in Iredell County, where they are located, and how they can be used.

They went into the county knowing they likely would find many soils they had already seen, and perhaps some they had not. As they traveled over the county, they observed steepness, length, and shape of slopes; size and speed of streams; kinds of native plants or crops; kinds of rock; and many facts about the soils. They dug or bored many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down to the rock material that has not been changed much by leaching or by roots of plants.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to uniform procedures. To use this report efficiently, it is necessary to know the kinds of groupings most used in a local soil classification.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Cecil and Mecklenburg, for example, are the names of two soil series. All the soils in the United States having the same series name are essentially alike in natural characteristics.

Soil series contain soils that are alike except for the texture of their surface layer. According to this difference in texture, separations called soil types are made. Within a series, all the soils having a surface layer of the same texture belong to one soil type. Cecil sandy loam and Cecil clay loam are two soil types in the Cecil series. The difference in texture of their surface layers is apparent from their names.

Some soil types vary so much in slope, degree of erosion, number and size of stones, or some other feature affecting their use that practical suggestions about their management could not be made if they were shown on the soil map as one unit. Such soil types are divided into soil phases. The name of a soil phase indicates a feature that affects management. For example, Cecil sandy loam, 2

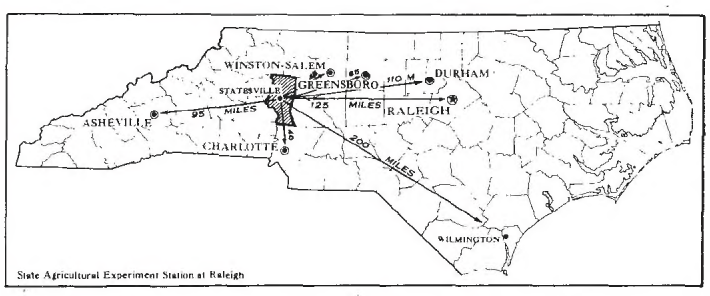

Figure 1.—Location of Iredell County in North Carolina.

to 6 percent slopes, is one of several phases of Cecil sandy loam, a soil type that ranges from nearly level to moderately steep.

After a fairly detailed guide for classifying and naming the soils had been worked out, the soil scientists drew soil boundaries on aerial photographs. They used photos for their base map because they show woodlands, buildings, field borders, trees, and similar detail that greatly help in drawing boundaries accurately. The soil map in the back of this report was prepared from the aerial photographs.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning management of farms and fields, a mapping unit is nearly equivalent to a soil type or a phase of a soil type. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some other kind that have been seen within an area that is dominantly of a recognized soil type or soil phase.

In preparing some detailed maps, the soil scientist has a problem of delineating areas where the differences between two soils are too slight to justify separate recognition, even though the soils are not regularly associated geographically. Therefore, the soils are shown as one mapping unit, or as an undifferentiated group. The unit is named for the major soil series in it, for example, Warne and Roanoke fine sandy loams.

Also, in most mapping, there are areas to be shown that are so rocky, so shallow, or so frequently worked by wind and water that they cannot be called soils. These areas are shown on a soil map like other mapping units, but they are given descriptive names, such as Severely gullied land or Made land, and are called land types rather than soils.

Only part of the soil survey was done when the soil scientist had named and described the soil series and mapping units, and had shown the location of the mapping units on the soil map. The mass of detailed information he had recorded then needed to be presented in different ways for different groups of users, among them farmers, managers of woodland, and engineers.

To do this efficiently, he had to consult with persons in other fields of work and jointly prepare with them groupings that would be of practical value to different users. Such groupings are the capability classes, subclasses, and units, designed primarily for those interested in producing short-lived crops and tame pasture; woodland groups, for those who need to manage wooded tracts; and the classifications used by engineers who build highways or structures to conserve soil and water.

General Soil Map

Soils that occur together in a characteristic pattern make up a general soil area, or soil association. An association may consist of only a few or of many soils. The soils may be similar or they may differ greatly. Although closely associated geographically, the soils in a general soil area may differ in their suitability for agricultural use.

A generalized soil map was made showing seven soil associations in the county. The boundaries of the associations are shown on the colored general soil map in the back of this report. Such a map is useful to those who want a general idea of the soils, who want to compare different parts of the county, or who want to know the location of large areas suitable for a certain kind of farming or other broad land use. It does not show accurately the kinds of soils on a single farm or in a small tract.

Each soil association is named for the major soil series in it, but soils of other series may also be present. The Lloyd association and the Lloyd-Cecil association, which are north of Statesville, are the most important areas for agriculture. The other soil associations are less important for farming, but they also have distinct patterns of soils, and the differences among the soils are important to the farms within each general area.

In the following pages the soil associations in the county are discussed and their general use for agriculture is described. More detailed information about the soils is given in the section "Descriptions of the Soils."

1. Cecil Association

Deep, gently sloping to steep, well-drained soils with a subsoil of reddish clay, on granite, gneiss, and schist

This soil association makes up about 51 percent of the county. It is on fairly broad ridges and on steep slopes next to drainageways. The areas are large and are south of Statesville and north of the South Yadkin River. The Cecil soils make up about 80 percent of this association. They are deep and well drained, and they developed on uplands in deep material weathered from fine-grained gneiss, schist, or granite. The Cecil soils generally have a surface layer of grayish-brown to reddish-brown, friable fine sandy loam or sandy loam and a subsoil of red, friable or firm clay. In areas that are severely eroded, the surface layer is red clay loam.

Less extensive soils in this association are the Lloyd, Appling, and Mayodan soils. These well-drained soils are in positions similar to those occupied by the Cecil soils. The Lloyd and Appling soils are more extensive than the Mayodan, which occur only near the community of V-Point.

Steep Louisa and Louisburg soils occupy minor areas of the association next to drainageways. In addition, the Starr soils, Local alluvial land, and the Colfax and Worsham soils are in draws along intermittent drains, at the heads of some permanent streams, and in other positions where there are deposits of local alluvium and colluvium. On the stream terraces are small areas of Hiwassee, Wickham, and Altavista soils and of Warne and Roanoke soils. On the first bottoms are other small areas of Congaree, Chewacla, and Wehadkee soils, and of Mixed alluvial land. These minor soils are well drained to poorly drained.

Most of this association is in capability classes II and III. Except for the steep slopes, most of the areas were cleared at some time, but the areas that were severely eroded and gullied have mostly reseeded to Virginia pine. Now, about half of the acreage is used for crops. The farms are generally less than 100 acres in size, and many of them are operated part time by the owner, who also works at another job off the farm. Most of the farms are dairy farms or are farms on which cotton and small grains are the principal crops.

The soils in this association are susceptible to erosion, but they respond well to good management. The soils that

are not eroded are easy to till and are suited to many crops. Corn, cotton, and small grains are the chief crops, but tobacco is grown in some places north of the South Yadkin River. The soils are not so well suited to alfalfa as the Lloyd, Davidson, and Hiwassee soils of association 2.

2. Lloyd-Cecil Association

Deep, gently sloping to strongly sloping, well-drained soils with a subsoil of yellowish-red to dark-red clay, on gneiss and mixed acidic and basic rocks

This soil association makes up about 27 percent of the county. The areas are on broad ridges and steep slopes adjacent to the major drainageways. They are mainly in the west-central and northern parts of the county, although a small area is in the extreme southern part of the county next to the Mecklenburg County line. The dominant soils in the association are the Lloyd and Cecil. They are deep, well-drained soils of the uplands, and they have a well-developed profile.

The Lloyd and Cecil soils are in similar positions. In many places they lie side by side, but most of the areas next to drainageways are occupied by Cecil soils. The Lloyd soils make up 43 percent of the association. They formed in mixed material weathered from acidic and basic rocks. The Cecil soils make up 35 percent of the association. They formed in material weathered from fine-grained granite, gneiss, schist, and other acidic rocks.

The Lloyd soils have a surface layer of reddish-brown to dark reddish-brown fine sandy loam or loam, and their subsoil is red to dark-red, firm clay. The surface layer of the Cecil soils is reddish-brown to grayish-brown fine sandy loam or sandy loam, and their subsoil is red, friable or firm clay.

The Appling, Davidson, and Madison soils occupy a smaller acreage in the association. The Appling and Davidson soils are well drained. They are in positions similar to those occupied by the Lloyd and Cecil soils, but the Davidson soils are near the Lloyd, and the Appling soils are near the Cecil. In places the Appling and Cecil soils are side by side on the same slope. The Madison soils are in positions similar to those occupied by the Lloyd and Cecil soils.

Strongly sloping to steep areas of this association are occupied by other minor soils—the Louisburg, Louisa, and Wilkes. These soils are well drained and are shallow over bedrock. They have little or no horizon differentiation.

In draws along intermittent drains, on toe slopes at the base of some steep slopes, at the heads of streams, and in other positions where there are deposits of local alluvium and colluvium are the Starr, Colfax, and Worsham soils and Local alluvial land. On the stream terraces are the Hiwassee, Wickham, and Altavista soils and the Warne and Roanoke soils. These minor soils are well drained to poorly drained.

Most of this association is in capability classes II and III. Except for the steep areas, most of the acreage was cleared at some time, but the areas that have been severely eroded and gullied have mostly reseeded to Virginia pine. About 55 percent of the acreage is now used for crops. The farms are generally less than 100 acres in size, and most of them are operated full time by the owner. Dairy farms and farms on which cotton and small grains are grown are dominant.

The soils in this association are susceptible to erosion, but they respond well to good management. The areas that are not severely eroded are fairly easy to till and are well suited to corn, cotton, small grains, hay, and pasture. The Lloyd, Davidson, and Hiwassee soils are the best soils for alfalfa. Many of the strongly sloping and moderately steep areas in this association are in pasture.

3. Lloyd Association

Deep, well-drained soils with a subsoil of dark-red clay on broad ridges that have short side slopes, on mixed acidic and basic rocks

This soil association makes up about 11 percent of the county. It is next to drainageways on broad, gently sloping ridges that have short side slopes. The areas are mainly north of Statesville, west of Elmwood, and in the southeastern corner of the county next to the Rowan County and Cabarrus County lines.

The Lloyd soils make up 75 percent of the association. They have a well-developed profile and are deep and well drained. These soils formed on uplands in thick beds of material weathered from mixed acidic and basic rocks. In areas that are not severely eroded, their surface layer is dark reddish-brown to reddish-brown loam or fine sandy loam, and their subsoil is dark-red, friable or firm clay. In areas that are severely eroded, the surface layer is dark-red clay loam.

The Cecil, Davidson, and Mecklenburg soils occupy a minor part of this association. They are well drained and are on uplands. These soils are in positions similar to those occupied by the Lloyd soils, and in many places they are adjacent to the Lloyd soils.

Other minor soils are the Iredell soils, which are on some of the ridgetops. In addition there are sloping to steep areas of Wilkes soils and areas of Louisburg and Louisa soils, which are shallow over bedrock and have little or no horizon differentiation. In draws along intermittent drainageways, at the heads of some permanent streams, and on toe slopes at the base of steep slopes are the Starr, Colfax, and Worsham soils and Local alluvial land. Hiwassee, Altavista, and Warne and Roanoke soils are on stream terraces, and Congaree, Chewacla, and Wehadkee soils and Mixed alluvial land are on first bottoms. These minor soils range from well drained to poorly drained. They occupy only a small acreage in the association.

Most areas of this association are in capability classes II and III. Except for the steep areas, most of the acreage was cleared at some time, but the areas that have been severely eroded have mostly reseeded to Virginia pine. Now, in most places about two-thirds of the acreage is in crops. In the southeastern corner of the county, however, slightly less than half of the acreage is used for crops. The farms are about 100 acres in size, and most of them are operated by the owner. Dairying, the raising of poultry and beef cattle, and the growing of cotton and small grains are the chief farm enterprises.

The soils in this association are susceptible to erosion. In places they are difficult to till, but they respond well to good management. The soils are well suited to corn, small grains, alfalfa, lespedeza, and pasture. Many of the sloping to moderately steep areas are in pasture.

4. Cecil-Appling Association

Deep, gently sloping or sloping, well-drained soils with a subsoil of red or yellowish-red clay, on granite, gneiss, and schist

This soil association makes up about 7 percent of the county. It is on broad, gently sloping ridges and steep slopes next to drainageways. The largest areas are between Statesville and Amity, but small, scattered areas are north of the South Yadkin River, and one small area is along the Catawba River, north of East Monbo.

The Cecil and Appling soils, on uplands, are dominant in the association. They are deep and well drained, and they have a well-developed profile.

The Cecil soils, formed in material weathered from fine-grained granite, gneiss, and schist, make up 45 percent of the association. The Appling soils, formed in material weathered from coarser grained granite and gneiss, make up about 40 percent of the association. These soils occur in similar positions. In many places they lie side by side, but most areas of Cecil soils are steep and are next to the major drainageways.

The Cecil soils have a surface layer of reddish-brown to grayish-brown fine sandy loam or sandy loam and a subsoil of red clay. In areas that are severely eroded, their surface layer is red clay loam. The Appling soils have a surface layer of light yellowish-brown to grayish-brown sandy loam and a subsoil of strong-brown to yellowish-red clay. In areas that are severely eroded, the surface layer is yellowish sandy clay loam.

A number of minor soils are included in this association. On the uplands are the Lloyd, Wilkes, Louisburg, and Louisa soils. The Lloyd soils are dark red. They are well drained and occupy positions similar to those occupied by the Cecil and Appling soils. The Lloyd soils are commonly near the Cecil soils, but in only a few places are they near the Appling soils. The Wilkes soils and the Louisburg and Louisa soils are well drained and are shallow over bedrock. They have little or no horizon differentiation. The Wilkes, Louisburg, and Louisa soils are mostly on strongly sloping to steep side slopes. The Starr, Colfax, and Worsham soils and Local alluvial land are in depressions where there are deposits of local alluvium and colluvium, in draws along intermittent drains, on toe slopes at the base of some steep slopes, and at the heads of some permanent streams. The Congaree, Buncombe, Chewacla, and Wehadkee soils, and Mixed alluvial land are on first bottoms and are well drained to poorly drained. The minor soils occupy only about one-sixth of the association.

Most of this association is in capability classes II and III. Except for the steep slopes, most of the areas were cleared at some time, but the areas that are severely eroded have generally reseeded to Virginia pine. About 55 percent of the acreage is now used for crops. The farms are generally less than 100 acres in size, and most of them are operated full time by the owner. Most of the farms are dairy farms and farms on which small grains are the main crops.

The soils in this association are susceptible to erosion, but they respond well to good management. They are easy to till if they are not eroded. Corn, cotton, small grains, and some kinds of hay are the chief crops, and the soils are well suited to them. Many of the sloping to moderately steep areas are in pasture.

5. Cecil-Madison Association

Shallow to deep, strongly sloping to steep, well-drained soils that have a sandy or gravelly surface layer and a subsoil of yellowish-red to red clay, on gneiss and quartz mica schist

This soil association makes up about 2 percent of the county. The areas are broken and are on fairly narrow ridges and on steep slopes next to drainageways. They are near Union Grove and in the northwestern part of the county. The Cecil and Madison soils are dominant. These soils are on uplands, and they formed in thick beds of material weathered from acidic rocks, primarily schist. They are well drained and are shallow to deep over bedrock. Their profile is moderately well developed.

The Cecil soils, formed in material weathered from fine-grained granite, gneiss, schist, and other acidic rocks, make up about 40 percent of this association. The Madison soils, formed primarily in material weathered from schist that contains a large amount of mica, make up about 35 percent. The Cecil and Madison soils occupy similar positions, and in many places they are adjacent. The Cecil soils are deep. They have a surface layer of reddish-brown to grayish-brown fine sandy loam or sandy loam and a subsoil of friable or firm, red clay. The Madison soils are shallow to moderately shallow over bedrock. They have a surface layer of reddish-brown to grayish-brown gravelly fine sandy loam and a subsoil of red to yellowish-red, friable clay loam. In areas that are severely eroded, the surface layer of the Madison soils is red clay loam.

The total acreage of the Appling, Lloyd, Wilkes, and the Louisburg and Louisa soils is smaller than that of the Cecil and Madison soils. The Appling and Lloyd soils are in positions similar to those occupied by the Cecil and Madison soils. Strongly sloping to steep Wilkes, Louisburg, and Louisa soils are on side slopes. They are shallow over bedrock and have little or no horizon differentiation. All of these soils are well drained. The Appling, Louisburg, and Louisa soils are the most extensive of these minor soils.

In depressions where there are deposits of local alluvium and colluvium, in draws along intermittent drainageways, on toe slopes at the base of some steep slopes, and at the heads of intermittent streams are the Starr, Colfax, and Worsham soils and Local alluvial land. On the first bottoms are the Congaree, Buncombe, Chewacla, and Wehadkee soils and Mixed alluvial land. The soils in these areas range from well drained to poorly drained.

Most of the soils in this association are in capability classes III and IV. Except for the steep slopes, most of the areas have been cleared. Most areas that have been severely eroded or gullied have reseeded to Virginia pine. Slightly less than half of the acreage is used for crops. The farms are mostly less than 100 acres in size. Many of them are operated by the owner, who also works at another job off the farm. Dairy farms and farms on which cotton, tobacco, and small grains are the chief crops are dominant.

The soils in this association are susceptible to erosion, but they respond well to management. In places they are somewhat difficult to till because of the high content of

gravel in the surface layer. The soils are well suited to corn, cotton, tobacco, and small grains, which are the chief crops. Many of the strongly sloping and moderately steep areas are in pasture.

6. Iredell-Mecklenburg-Lloyd Association

Shallow to deep soils of broad ridges and short side slopes that have a subsoil of very firm, plastic clay or firm clay, on basic rocks or mixed acidic and basic rocks

This soil association makes up only about 1 percent of the county. The areas are on broad ridges and on short side slopes in the uplands next to drainageways. They are between Elmwood and the Rowan County line. The Iredell, Mecklenburg, and Lloyd soils are shallow to deep and are well drained to moderately well drained. They formed in material weathered from basic rocks or from mixed acidic and basic rocks.

The Iredell soils make up 40 percent of this association; the Mecklenburg soils, 35 percent; and the Lloyd soils, 15 percent. The Iredell and Mecklenburg soils formed in material weathered from diorite, gabbro, and other basic rocks, but the Lloyd soils formed in a mixture of material from acidic and basic rocks. These soils are gently sloping and sloping. In many places they are side by side on the same slope, but the Mecklenburg soils are generally next to the Lloyd soils, rather than the Iredell. Also the Mecklenburg and Lloyd soils are on steeper side slopes than the Iredell soils.

The Lloyd soils are deep and well drained. They have a surface layer of reddish-brown to dark reddish-brown fine sandy loam or loam and a subsoil of red to dark-red, firm clay. The Mecklenburg soils are also well drained, but moderately deep, and they have a surface layer of grayish-brown to reddish-brown loam. Their subsoil is olive-brown to red, firm clay. The Iredell soils are somewhat poorly drained to moderately well drained. They have a surface layer of very dark grayish-brown to olive loam and a subsoil of light olive-brown to yellowish-brown, very firm clay. In areas that are severely eroded, the Iredell soils have a surface layer of clay loam.

Of the minor soils in this association, the Davidson and Cecil soils are deep and well drained and the Wilkes are shallow over bedrock. There are also small areas of other soils in depressions and in draws where local alluvium or colluvium has been deposited.

Most areas in this association are in capability classes II and III. The areas that have been severely eroded or gullied have mostly reseeded to Virginia pine. About 60 percent of the acreage is now used for crops. The farms are generally less than 100 acres in size. Most of them are operated by the owner, who also works at another job off the farm. Dairy farms and farms on which row crops are the principal crops predominate.

The soils in this association are susceptible to erosion, but they respond fairly well to good management. The soils are difficult to till if they are either too wet or too dry, especially in areas that are severely eroded. Cotton, corn, and small grains are the chief crops, but some of the steep soils are in pasture.

7. Cecil-Wilkes Association

Deep to shallow, steep, stony soils of foothills, on mixed acidic and basic rocks or acidic rocks

This soil association makes up only about 1 percent of the county. The areas are steep and are on narrow ridges. They are in the northwestern corner of the county next to Wilkes and Alexander Counties. Stony Cecil and Wilkes soils make up most of the acreage. These soils formed on uplands in beds of material weathered from granite, gneiss, or schist, or from mixed acidic and basic rocks. They are well drained and range from shallow to deep over bedrock. Their profile ranges from poorly developed to well developed. Rock outcrops, stones, and gravel are common on the surface of these soils.

The Cecil soils occupy nearly three-fourths of the association. They formed in material weathered from fine-grained granite, gneiss, schist, and other acidic rocks. The Wilkes soils occupy most of the rest of the association. They formed in material weathered from mixed acidic and basic rocks or from basic rocks.

The Cecil soils are deep to moderately deep. Their surface layer is reddish-brown to dark-brown stony fine sandy loam, and their subsoil is red, friable clay loam. The Wilkes soils are shallow over bedrock, and they have little or no horizon differentiation. Their surface layer is dark grayish-brown to light olive-brown fine sandy loam or loam that is stony in most places. Their subsoil is olive yellow to yellowish brown and varies in texture.

The Appling soils on some of the ridgetops are also in this association. The Louisburg and Louisa soils are shallow and occupy positions similar to those occupied by the Cecil and Wilkes soils. In depressions where there are deposits of local alluvium and colluvium, in draws along intermittent drainageways, on toe slopes at the base of some steep slopes, and at the heads of some permanent streams are some Colfax and Worsham soils and Local alluvial land. On the first bottoms are the Congaree and Chewacla soils. All of these are minor in the association; they range from well drained to poorly drained.

Most of the soils in this association are in capability classes VI and VII. The farms are mostly more than 100 acres in size, and they are operated part time by the owner, who also works at another job off the farm. Most of the soils are in forest made up of hardwoods or pines. Only about 10 percent or less of the acreage is cultivated or used for pasture. Because of the steep slopes and the hazard of erosion, most of the soils are not suited to crops.

Use and Management of the Soils

In Iredell County the soils are mostly deep and are well drained. They range from nearly level to steep but are mostly gently sloping. The soils are generally easy to till. The most important problems of management are maintaining and improving fertility and the supply of organic matter in the soils and preventing losses of soil and water. The soils on terraces and those where alluvium and colluvium have accumulated are wet in places

and require drainage. Most of the soils are acid and require lime and fertilizer for high yields of all crops and pasture plants.

The farms in the county are mostly less than 100 acres in size. Most of them are worked by the owner, who also works off the farm at another job. The farms are mainly dairy farms or farms on which cotton and small grains are the chief crops.

Small grains are grown mainly in the northern half of the county and around Amity. Cotton is planted in all parts of the county, but chiefly in the eastern part. Tobacco, one of the main cash crops, is grown north of the South Yadkin River, and nursery products are grown mostly near Statesville. There are woodlands in all parts of the county, but the largest areas are in the northwestern corner of the county and in an area along the Catawba River. Trees are being planted in all parts of the county, particularly on the steep soils.

In the following pages the use and management of the soils is described. First, the system of capability classification used by the Soil Conservation Service is explained. Then, management of groups of soils, the capability units, is described and information about crop yields and management practices is given. This is followed by a discussion of management of the soils for woodland and for engineering.

Capability Groups of Soils

The capability classification is a grouping of soils that shows, in a general way, how suitable the soils are for most kinds of farming. It is a practical grouping based on limitations of the soils, the risk of damage when they are used, and the way they respond to treatment.

In this system all the kinds of soil are grouped at three levels, the capability class, subclass, and unit. The eight capability classes in the broadest grouping are designated by Roman numerals I through VIII. In class I are the soils that have few limitations, the widest range of use, and the least risk of damage when they are used. The soils in the other classes have progressively greater natural limitations. In class VIII are soils and landforms so rough, shallow, or otherwise limited that they do not produce worthwhile yields of crops, forage, or wood products.

The subclasses indicate major kinds of limitations within the classes. Within most of the classes there can be as many as four subclasses. The subclass is indicated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* means that water in or on the soil will interfere with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the country, indicates that the chief limitation is a climate that is too cold or too dry.

In class I there are no subclasses, because the soils of this class have few or no limitations. Class V can contain, at the most, only subclasses *w*, *s*, and *c* because the soils in it have little or no erosion hazard but have other limitations that limit their use largely to pasture, woodland, or wildlife.

Within the subclasses are the capability units, groups of soils enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally identified by numbers assigned locally, for example, IIe–1 or IIIe–2.

Soils are classified in capability classes, subclasses, and units in accordance with the degree and kind of their permanent limitations; but without consideration of major and generally expensive landforming that would change the slope, depth, or other characteristics of the soil. Capability grouping also does not take into consideration possible, but unlikely, major reclamation projects.

The capability classes, subclasses, and units in Iredell County are described in the list that follows.

Class I.—Soils that have few limitations that restrict their use. (None in Iredell County; no subclasses.)

Class II.—Soils that have some limitations that reduce the choice of plants or that require moderate conservation practices.

- Subclass IIe. Soils subject to moderate erosion if they are not protected.
  - Unit IIe–1. Well drained to moderately well drained, gently sloping soils that are coarse textured and friable.
  - Unit IIe–2. Well-drained, gently sloping, medium-textured soils.
  - Unit IIe–3. Nearly level to gently sloping, fine-textured, compact, plastic soils.
- Subclass IIw. Soils that have moderate limitations because of excess water.
  - Unit IIw–1. Level or nearly level, well-drained soils of first bottoms that are subject to occasional overflow.

Class III.—Soils that have severe limitations that reduce the choice of plants, or that require special conservation practices, or both.

- Subclass IIIe. Soils subject to severe erosion if they are cultivated and not protected.
  - Unit IIIe–1. Well-drained, sloping soils that are coarse textured.
  - Unit IIIe–2. Well-drained, sloping or gently sloping soils that are medium to fine textured and friable.
  - Unit IIIe–3. Sloping, well-drained soil that has a compact, fine-textured, slightly plastic subsoil.
- Subclass IIIw. Soils that have severe limitations because of excess water.
  - Unit IIIw–1. Level or nearly level, somewhat poorly drained soils of first bottoms that are subject to frequent overflow.
  - Unit IIIw–2. Nearly level to gently sloping, somewhat poorly drained to poorly drained soils on uplands and stream terraces or in areas where colluvium has accumulated.
- Subclass IIIs. Soils that have severe limitations because of low fertility and small capacity for holding water available to plants.
  - Unit IIIs–1. Nearly level, excessively drained, very sandy soil of the first bottoms.

Class IV.—Soils that have very severe limitations that restrict the choice of plants, require very careful management, or both.
- Subclass IVe. Soils subject to very severe erosion if they are cultivated and not protected.
  - Unit IVe-1. Strongly sloping, well drained soils that are coarse textured and friable.
  - Unit IVe–2. Strongly sloping, well-drained soils that are medium textured to fine textured and friable.
  - Unit IVe–3. Sloping and strongly sloping, somewhat poorly drained to well-drained, mostly shallow soils that are compact, fine textured, and plastic.
- Subclass IVw. Soils that have very severe limitations for cultivation because of excess water.
  - Unit IVw–1. Nearly level, poorly drained soils of first bottoms and stream terraces.
  - Unit IVw–2. Gently sloping, poorly drained soil from local alluvium and colluvium.

Class V.—Soils susceptible to little or no erosion but having other limitations, impractical to remove, that limit their use largely to pasture, to woodland, or to wildlife food or cover. (None in Iredell County.)

Class VI.—Soils that have severe limitations that generally make them unsuitable for cultivation and that limit their use largely to pasture, to woodland, or wildlife food or cover.
- Subclass VIe. Soils severely limited, chiefly by risk of erosion, if protective cover is not maintained.
  - Unit VIe 1. Moderately steep, well-drained soils.
  - Unit VIe 2. Strongly sloping, well-drained soils that are medium textured.
  - Unit VIe–3. Strongly sloping soils that have little or no horizon differentiation and are shallow over bedrock.

Class VII.—Soils that have very severe limitations that make them unsuitable for cultivation and that restrict their use largely to grazing, woodland, or wildlife.
- Subclass VIIe. Soils very severely limited, chiefly by risk of erosion, if protective cover is not maintained.
  - Unit VIIe–1. Steep, stony soils that are well drained and are shallow over bedrock.
  - Unit VIIe–2. Gently sloping to moderately steep soils that are severely eroded, and land that is moderately to severely gullied.

Class VIII. Soils and landforms that have limitations that preclude their use for growing plants commercially and restrict their use to recreation, wildlife, water supply, or esthetic purposes. (None in Iredell County.)

Management by Capability Units

The soils in one capability unit have about the same limitations and similar risks of damage. All of the soils in one unit, therefore, need about the same kind of management, though they may have formed from different kinds of parent material and in different ways.

The capability units are described in the following pages. The soils in each unit are listed, and management suitable for all the soils in one unit is suggested. For most of the units, suitable cropping systems are listed. The acreage given for each unit is from measured data.

682–958—64——2

The discussion is a general guide to the use and management of the soils in the county. It does not suggest some of the details of management for specific soils. Additional help in managing the soils can be obtained by consulting the local representative of the Soil Conservation Service, the county agricultural agent, or a member of the staff of the State Agricultural Experiment Station.

Capability unit IIe–1

In this unit are well drained to moderately well drained, gently sloping soils that are coarse textured and friable. These soils are on ridges in the uplands, on the ridges of high stream terraces, and on stream terraces of moderate height. They are also in draws, at the heads of or along permanent and intermittent streams, on toe slopes, and in other areas where there are deposits of local alluvium and colluvium. The surface layer of these soils is sandy loam and is 3 to 24 inches thick. The subsoil is friable or firm sandy clay loam to clay. The following soils are in this unit:

Altavista fine sandy loam, 2 to 6 percent slopes.
Altavista fine sandy loam, 2 to 6 percent slopes, eroded.
Appling sandy loam, 2 to 6 percent slopes.
Appling sandy loam, 2 to 6 percent slopes, eroded.
Cecil fine sandy loam, 2 to 6 percent slopes.
Cecil fine sandy loam, 2 to 6 percent slopes, eroded.
Cecil sandy loam, 2 to 6 percent slopes.
Cecil sandy loam, 2 to 6 percent slopes, eroded.
Cecil gravelly fine sandy loam, 2 to 6 percent slopes.
Cecil gravelly fine sandy loam, 2 to 6 percent slopes, eroded.
Lloyd fine sandy loam, 2 to 6 percent slopes.
Lloyd fine sandy loam, 2 to 6 percent slopes, eroded.
Local alluvial land.
Madison gravelly fine sandy loam, 2 to 6 percent slopes.
Madison gravelly fine sandy loam, 2 to 6 percent slopes, eroded.
Mayodan sandy loam, 2 to 6 percent slopes, eroded.
Wickham fine sandy loam, 2 to 6 percent slopes, eroded.
Wickham fine sandy loam, 2 to 6 percent slopes.

These soils are low in organic matter. They are low to medium in natural fertility and are medium acid to strongly acid. Their subsoil is moderate in permeability and in available water capacity.

Some of these soils contain gravel that somewhat interferes with tillage. Except for Local alluvial land, most of the soils in areas that have been cleared have lost from one-fourth to three-fourths of their original surface layer through erosion.

The soils in this unit occupy about 92,000 acres. Approximately 69 percent of the acreage is in crops, about 20 percent is in trees, and most of the rest is in pasture.

These soils are suited to corn, tobacco, cotton, soybeans, lespedeza, small grains, truck crops, and other crops. They are also suited to ladino clover, alfalfa, fescue, and orchardgrass grown for forage. The soils need a cropping system that will help protect them from erosion. Suitable cropping systems follow:

1. First year, tobacco followed by winter cover; second year, corn followed by small grain and fescue; third year, small grain and fescue; fourth year, fescue.
2. First year, corn; second year, cotton followed by small grain; third year, small grain followed by lespedeza; fourth year, lespedeza.
3. First year, tobacco followed by small grain and fescue; second year, small grain and fescue.
4. First year, corn or cotton followed by small grain; second year, small grain followed by lespedeza.

The soils of this unit require potash and phosphate for high yields of all field crops and pasture plants, and they need nitrogen for high yields of nonlegumes. They also require boron for good stands of alfalfa. Because these soils are naturally acid, lime is required if most crops are to grow well. The soils ought to be limed when they are first cleared. Then soil tests should be made every 3 to 5 years to determine the needs for lime and fertilizer.

Growing row crops repeatedly and removing or burning the crop residues would nearly deplete the supply of organic matter in these soils. The fertility and available water capacity would also be lowered, and the soils would become harder to work. Turning under crop residues and cover crops and adding manure will help to maintain the supply of organic matter. It is not feasible, however, to build the organic matter to a high level, because organic matter oxidizes rapidly in these soils.

Generally, these soils are easy to till, but some of them contain gravel that hinders tillage slightly. Also, the soils in which the plow layer consists mostly of material from the subsoil, or those in which the supply of organic matter has not been maintained, are less easy to till. The soils that are not eroded can be tilled within a fairly wide range of moisture content. The soils that are eroded can be tilled only within a narrow range of moisture content, and it is difficult to get a good stand of crops on them. If the eroded soils are worked when wet, they puddle and crust.

Sheet erosion is the chief hazard when these soils are cultivated. To help control erosion, cultivate on the contour, construct terraces that empty into sodded waterways, and grow close-growing cover crops. If parallel terraces are used wherever feasible, short rows will be eliminated and tillage will be made easier.

The soils in this unit are suitable for sprinkler irrigation. Irrigation would probably not pay, however, except for tobacco, truck crops, and other crops of high value.

Capability unit IIe–2

In this unit are well-drained, gently sloping soils that are medium textured. These soils are generally on broad ridges in the uplands, on the ridges of high stream terraces, and on stream terraces of moderate height. They are also in draws, at the heads of or along permanent and intermittent streams, on toe slopes, and in other areas where there are deposists of local alluvium and colluvium. The surface layer of these soils is friable loam or clay loam and is 3 to 18 inches thick. Their subsoil is friable or firm clay loam to clay. The following soils are in this unit:

Davidson clay loam, 2 to 6 percent slopes, eroded.
Hiwassee loam, 2 to 6 percent slopes, eroded.
Lloyd loam, 2 to 6 percent slopes.
Lloyd loam, 2 to 6 percent slopes, eroded.
Starr loam.

These soils are medium to low in organic matter. They are acid and are medium in natural fertility. The subsoil is moderate in permeability and in available water capacity. Except for the soils underlain by alluvium and colluvium, most of the soils are moderately eroded.

The soils in this unit occupy about 13,700 acres. Approximately 66 percent of the acreage is cultivated, and about 30 percent of the remainder is in about equal acreages of pasture and trees.

These soils are suited to corn, cotton, small grains, soybeans, lespedeza, and many other crops. They are especially well suited to alfalfa, ladino clover, fescue, and orchardgrass grown for forage (fig. 2). Good-quality, flue-cured tobacco does not grow on these soils. A cropping system is needed that will help to protect the soils from erosion. Suitable cropping systems follow:

1. First year, corn followed by winter cover; second year, cotton or corn followed by small grain and fescue; third year, small grain and fescue followed by lespedeza or clover; fourth year, fescue and legumes.
2. First year, corn; second year, cotton followed by small grain; third year, small grain and lespedeza; fourth year, lespedeza.
3. First year, corn or cotton followed by small grain and fescue; second year, small grain and fescue.
4. First year, corn or cotton followed by small grain; second year, small grain followed by lespedeza.

The soils of this unit require potash and phosphate for high yields of all field crops and pasture plants, and they need nitrogen for high yields of nonlegumes. They also require boron for good stands of alfalfa. Because these soils are naturally acid, they require lime if most crops are to grow well. The soils ought to be limed when they are first cleared. Then soil tests should be made every 3 to 5 years to determine the needs for lime and fertilizer. These soils generally require less lime than most of the other soils in the county because they contain more natural calcium. They generally require more phosphate, however, because much of the phosphate is tied up in a form not available to plants.

Growing row crops repeatedly and removing or burning the crop residues would nearly deplete the supply of organic matter in these soils. The fertility and available water capacity would also be lowered, and the soils would become harder to work. Turning under crop residues and cover crops and adding manure will help to maintain the supply of organic matter. It is not feasible, however, to

Figure 2.—**Pasture of grass and clover on Lloyd loam, 2 to 6 percent slopes, eroded.**

build the organic matter to a high level, because it oxidizes rapidly in these soils.

Except for the eroded areas, these soils are fairly easy to till. In the eroded areas tillage is somewhat difficult and it is hard to obtain a good stand of crops. The soils in this unit should not be tilled if they are too wet or too dry, because they are likely to puddle or clod.

Sheet erosion is the chief hazard when these soils are cultivated. To help control erosion, cultivate on the contour, construct terraces that empty into sodded waterways, and grow close-growing cover crops. If parallel terraces are used wherever feasible, short rows will be eliminated and tillage will be made easier.

The soils in this unit are suitable for sprinkler irrigation. Irrigation will probably not pay, however, unless crops of high value are grown.

Capability unit IIe–3

In this unit are nearly level to gently sloping, fine-textured soils that are compact or plastic. The soils are somewhat poorly drained to well drained. They are generally on broad ridges in the uplands. The surface layer of these soils is friable loam that is 3 to 12 inches thick. The subsoil is firm or very firm clay. The following soils are in this unit:

Iredell loam, 2 to 6 percent slopes, eroded.
Mecklenburg loam, 2 to 6 percent slopes, eroded.

These soils are low to medium in organic matter. They are medium to low in natural fertility and are medium acid to slightly acid. The subsoil is slow or moderately slow in permeability and is moderate to low in available water capacity. Most of the areas that have been cleared are moderately eroded.

The soils in this unit occupy about 1,900 acres. Approximately 58 percent of the acreage is cultivated, and about 39 percent is in trees.

These soils are suited to corn, cotton, small grains, soybeans, lespedeza, and other crops. They are also suited to ladino clover, fescue, and orchardgrass grown for forage. They are not well suited to production of high-quality flue-cured tobacco. A cropping system is needed to help protect these soils from erosion. Suitable cropping systems follow:

1. First year, corn; second year, cotton followed by small grain and fescue; third year, small grain and fescue followed by lespedeza or clover.
2. First year, cotton or corn followed by small grain; second year, small grain followed by lespedeza.

Potash and phosphate are required for high yields of all field crops and pasture plants grown on these soils, and nitrogen is needed for high yields of nonlegumes. Because these soils are acid, lime is required if most crops are to grow well. The soils ought to be limed when they are first cleared. Then soil tests should be made every 3 to 5 years to determine the needs for lime and fertilizer. These soils have a higher content of calcium than some of the soils in the county, and, therefore, they require less lime.

Growing row crops repeatedly and removing or burning the crop residues would nearly deplete the organic matter in these soils. The fertility and available water capacity would also be lowered and the soils would become harder to work. Turning under crop residues and cover crops and adding manure will help to maintain the supply of organic matter. Because of rapid oxidation in the soils, however, it is not feasible to build the content of organic matter to a high level.

Because of the fine texture of their surface layer, these eroded soils are generally difficult to till. Sheet erosion is the chief hazard when they are cultivated. To help control erosion, cultivate on the contour, construct terraces that empty into sodded waterways, and grow close-growing cover crops. If parallel terraces are used wherever feasible, the short rows will be eliminated and tillage will be made easier. These soils are not well suited to irrigation.

Capability unit IIw–1

In this unit are level or nearly level, well-drained soils of first bottoms that are subject to occasional overflow. The texture of the soils is silt loam to sandy loam throughout the profile. These soils are only slightly eroded. The following soils are in this unit:

Congaree soils.
Mixed alluvial land.

These soils are low to medium in natural fertility and are acid. They are medium to low in organic matter. Permeability is moderately rapid or rapid, and the available water capacity ranges from high to low.

The soils in this unit occupy approximately 4,800 acres. About 45 percent of the acreage is cultivated, about 35 percent is in trees, and most of the rest is in pasture.

The soils in this unit are suited to corn, small grains, and soybeans. They are also suited to sorghum, milo, and other crops grown for silage, and to orchardgrass, ladino clover, and fescue grown for forage. Because of the hazard of flooding, these soils generally are not used for tobacco, alfalfa, or cotton.

These soils present no particular problems of management, except for the hazard of flooding. A winter cover crop is needed to help maintain their content of organic matter and thus to maintain their present fertility and available water capacity. Suitable cropping systems follow:

1. First year, corn followed by small grain; second year, small grain followed by lespedeza.
2. First year, corn followed by winter cover; second year, corn followed by small grain; third year, small grain followed by lespedeza; fourth year, lespedeza.
3. First year, corn followed by winter cover; second year, corn followed by small grain and fescue; third year, small grain and fescue followed by lespedeza.
4. First year, corn followed by winter cover; second year, corn followed by winter cover; third year, soybeans followed by winter cover.

Potash and phosphate are required for high yields of all field crops and pasture plants grown on these soils, and nitrogen is needed for high yields of nonlegumes. These soils generally require less fertilizer than most soils in the county. Because the soils are naturally acid, most crops need lime to make high yields. These soils ought to be limed when they are first cleared of trees. Then every 3 to 5 years the soils ought to be tested to determine the needs for lime and fertilizer.

The content of organic matter would be nearly depleted if these soils were repeatedly used for crops and the crop residues were removed or burned. The fertility of the soils and their available water capacity would also be reduced. In areas that are not flooded annually, turning under the crop residues and cover crops and adding manure will help to maintain the content of organic matter. Because of rapid oxidation in these soils, however, the supply of organic matter cannot be built to a high level.

Frequency of flooding can be reduced by clearing and widening or deepening the main channel of the streams; building structures to retard floodwaters on selected tributaries of the main streams; protecting the surrounding areas of uplands to prevent excessive runoff and silting of streams; and using other practices to help protect the watershed.

These soils are suited to sprinkler irrigation. Irrigation probably would pay if the areas were protected from flooding and crops of high value were grown.

Capability unit IIIe-1

In this unit are well-drained, sloping soils that are coarse textured. Some of the soils are on ridges and side slopes of rolling to gently rolling uplands. Others are on side slopes of high stream terraces or of terraces of moderate height. The surface layer of these soils is friable sandy loam and is 3 to 15 inches thick. Their subsoil is friable or firm sandy clay loam to clay. The following soils are in this unit:

Appling sandy loam, 6 to 10 percent slopes.
Appling sandy loam, 6 to 10 percent slopes, eroded.
Cecil fine sandy loam, 6 to 10 percent slopes.
Cecil fine sandy loam, 6 to 10 percent slopes, eroded.
Cecil sandy loam, 6 to 10 percent slopes.
Cecil sandy loam, 6 to 10 percent slopes, eroded.
Cecil gravelly fine sandy loam, 6 to 10 percent slopes.
Cecil gravelly fine sandy loam, 6 to 10 percent slopes, eroded.
Lloyd fine sandy loam, 6 to 10 percent slopes.
Lloyd fine sandy loam, 6 to 10 percent slopes, eroded.
Madison gravelly fine sandy loam, 6 to 10 percent slopes.
Madison gravelly fine sandy loam, 6 to 10 percent slopes, eroded.
Wickham fine sandy loam, 6 to 10 percent slopes, eroded.

These soils are low in organic matter. They are low to medium in natural fertility and are medium acid to strongly acid. Their subsoil is moderate in permeability and in available water capacity.

The soils in this unit occupy about 77,350 acres. Approximately 50 percent of the acreage is cultivated, 36 percent is in trees, and most of the rest is in pasture. In most areas that have been cleared, the soils are moderately eroded.

These soils are suited to corn, tobacco, cotton, soybeans, lespedeza, truck crops, and small grains. They are also suited to ladino clover, alfalfa, fescue, and orchardgrass grown for forage. The soils are highly susceptible to erosion if they are cultivated. They require practices that will help to prevent erosion, and a cropping system that will help to protect them. Suitable cropping systems follow:

1. First year, tobacco followed by small grain and fescue; second year, small grain and fescue; third year, fescue.
2. First year, corn and cotton followed by small grain and fescue; second year, small grain and fescue followed by lespedeza; third year, lespedeza.
3. First year, corn or cotton followed by small grain; second year, small grain followed by lespedeza; third year, lespedeza.
4. First year, corn followed by winter cover; second year, tobacco followed by small grain and fescue; third year, small grain and fescue; fourth year, fescue.

Potash and phosphate are required for high yields of all field crops and pasture plants grown on these soils, and nitrogen is needed for high yields of nonlegumes. Boron is also needed for good stands of alfalfa. Because these soils are naturally acid, lime is required for good growth of most crops. The soils ought to be limed when they are first cleared. Then soil tests should be made every 3 to 5 years to determine the needs for lime and fertilizer.

Growing row crops repeatedly and removing or burning the crop residues would nearly deplete the supply of organic matter in these soils. The fertility and available water capacity would also be lowered, and the soils would become harder to work. Turning under crop residues and cover crops and adding manure will help to maintain the supply of organic matter. It is not feasible, however, to build the supply to a high level, because organic matter oxidizes rapidly in these soils.

Generally, these soils are easy to till, but some of them contain gravel that hinders tillage slightly. Also, the soils in which the plow layer consists mostly of material from the subsoil or those in which the supply of organic matter has not been maintained are less easy to till. The soils that are not eroded can be tilled within a fairly wide range of moisture content. The soils that are eroded can be tilled only within a narrow range of moisture content, and it is difficult to get a good stand of crops on them. If the eroded soils are worked when wet, they puddle and crust.

Sheet erosion is the chief hazard when these soils are cultivated. To help control erosion, cultivate on the contour, construct terraces that empty into sodded waterways, and plant close-growing crops two growing seasons out of three. Stripcropping can be used on the high slopes. If parallel terraces are used wherever feasible, short rows will be eliminated and tillage will be made easier.

The soils in this unit are suitable for sprinkler irrigation. Irrigation would probably not pay, however, except for tobacco, truck crops, and other crops of high value.

Capability unit IIIe-2

In this unit are well-drained, sloping or gently sloping soils that are medium textured to fine textured and friable. These soils are on ridges and side slopes in the uplands. They are also on side slopes of high stream terraces and on terraces that are moderately high. Their surface layer is friable loam or clay loam and is 3 to 10 inches thick. Their subsoil is friable or firm clay loam to clay. The following soils are in this unit:

Cecil clay loam, 2 to 6 percent slopes, severely eroded.
Davidson clay loam, 6 to 10 percent slopes, eroded.
Hiwassee loam, 6 to 10 percent slopes, eroded.
Lloyd loam, 6 to 10 percent slopes.
Lloyd loam, 6 to 10 percent slopes, eroded.
Lloyd clay loam, 2 to 6 percent slopes, severely eroded.

These soils are medium to low in organic matter. They are medium in natural fertility and are acid. Their subsoil is moderate in permeability and in available water capacity.

The soils in this unit occupy about 16,250 acres. About 51 percent of the acreage is cultivated, a little more than 27 percent is in forest, and most of the rest is in pasture. Most of the acreage that has been cleared is moderately or severely eroded.

These soils are suited to corn, cotton, small grains, soybeans, and lespedeza. They are also suited to alfalfa, ladino clover, fescue, and orchardgrass grown for forage, but not to production of good quality, flue-cured tobacco. If the soils are cultivated, they need practices that will help to control erosion and a cropping system that will help to protect them. Suitable cropping systems follow:

1. First year, corn or cotton followed by small grain and fescue; second year, small grain and fescue followed by lespedeza or clover; third and fourth years, fescue and legumes.
2. First year, small grain followed by lespedeza; second year, lespedeza.
3. First year, corn or milo followed by small grain; second year, small grain followed by lespedeza; third year, lespedeza.
4. First year, corn or milo followed by small grain and fescue; second year, small grain and fescue followed by lespedeza.

The soils of this unit require potash and phosphate for high yields of all field crops and pasture plants and nitrogen for high yields of nonlegumes. They also need boron for a good stand of alfalfa. These soils generally require lime for good growth of most crops. Lime is especially needed in areas that have just been cleared. Soil tests ought to be made every 3 to 5 years to determine the needs for lime and fertilizer. Except for the Cecil soil, the soils generally require less lime than some of the other soils in the county because they contain more natural calcium. They generally require more phosphate, however, because much of the phosphate is tied up in a form not available to plants.

Growing row crops repeatedly and removing or burning the crop residues would nearly deplete the supply of organic matter in these soils. The fertility and available water capacity would also be lowered, and the soils would become harder to work. Turning under crop residues and cover crops and adding manure will help to maintain the supply of organic matter. It is not feasible, however, to build the supply of organic matter to a high level, because organic matter oxidizes rapidly in these soils.

The uneroded soils are generally fairly easy to till. In the eroded areas, however, tillage is more difficult and it is hard to obtain a good stand of crops. The eroded areas should not be tilled when too wet or too dry, because the soils are likely to puddle or clod.

Sheet erosion is the chief hazard when these soils are cultivated. To help control erosion, cultivate on the contour, construct terraces that empty into sodded waterways, and grow close-growing crops. In some areas the close-growing crops ought to be grown 3 years out of 4 or 2 years out of 3; they can be grown 1 year out of 2 if fescue or another perennial grass is used in the rotation. Stripcropping can be used on the high slopes. If parallel terraces are used wherever feasible, short rows will be eliminated and tillage will be made easier.

The soils in this unit are suitable for sprinkler irrigation. Irrigation generally would not pay, however, because most of the crops grown are of low value.

Capability unit IIIe–3

Only one soil—Mecklenburg loam, 6 to 10 percent slopes, eroded—is in this unit. It is sloping and well drained, and it has a compact, fine-textured subsoil. The areas are on sloping ridges or on side slopes in the uplands. The surface layer is loam, and the subsoil is firm, compact clay.

This soil has been moderately eroded and is low to medium in organic matter. It is also acid and is low to medium in natural fertility. The subsoil has moderately slow permeability and is moderate to low in available water capacity.

The soil in this unit occupies about 900 acres. Approximately 56 percent of the acreage is cultivated, and about 28 percent is in trees.

This soil is suited to corn, cotton, small grains, soybeans, lespedeza, and other crops. It is also suited to ladino clover, fescue, and orchardgrass grown for forage, but not to production of good-quality, flue-cured tobacco.

This soil is subject to further erosion if it is cultivated. It requires practices that will help to prevent erosion, and a suitable cropping system that will help to protect it. Suitable cropping systems follow:

1. First year, corn followed by small grain; second year, small grain and fescue followed by lespedeza; third year, fescue and lespedeza.
2. First year, corn followed by small grain; second year, small grain followed by lespedeza; third year, lespedeza.

Potash and phosphate are required for high yields of all crops and pasture plants, and nitrogen is needed for high yields of nonlegumes. Lime is required for good growth of most crops, especially in areas that have just been cleared. This soil generally requires less lime than most other soils in the county because it contains more calcium. Soil tests ought to be made every 3 to 5 years to determine the needs for lime and fertilizer.

Growing row crops repeatedly and removing or burning crop residues would nearly deplete the supply of organic matter in this soil. The fertility and available water capacity would also be lowered, and the soil would become harder to work. Turning under crop residues and cover crops and adding manure will help to maintain the supply of organic matter. It is not feasible, however, to build the organic matter to a high level, because it oxidizes rapidly in this soil.

This soil is difficult to till. In addition, it tends to puddle if it is tilled too wet, and it tends to clod if tilled too dry.

Sheet erosion is the chief hazard when this soil is cultivated. To help control erosion, cultivate on the contour, construct terraces that empty into sodded waterways, and use close-growing crops in the cropping system. Stripcropping can be used on the high slopes. If parallel terraces are used wherever feasible, short rows will be eliminated and tillage will be made easier.

Capability unit IIIw–1

The only soils in this unit are the Chewacla soils. They are level or nearly level and are somewhat poorly drained. These soils are on first bottoms that are subject to frequent overflow. They are generally between well drained soils that occupy areas along streams and poorly drained soils that are alongside escarpments. In some places they occupy an entire first bottom. In most places the profile of these soils consists of stratified silt loam to sandy loam.

These soils are medium in organic matter. They are acid and are low to medium in natural fertility. Permeability is moderately rapid, and the available water capacity is high. These soils receive deposits of overwash when the streams overflow.

The soils in this unit occupy about 20,400 acres. About 26 percent of the acreage is cultivated, and an acreage of about equal size is used for pasture. About 41 percent of the remainder is in trees.

The use of these soils for crops is restricted because of the hazard of overflow and the somewhat poor drainage. The soils are suited to corn, soybeans, and small grains. They are also suited to sorghum and milo grown for silage and to orchardgrass and fescue grown for forage. The soils are not well suited to tobacco, alfalfa, and cotton.

These soils require a cover crop in winter to maintain the present fertility, the supply of organic matter, and the available water capacity. Suitable cropping systems follow:

1. First year, corn followed by small grain; second year, small grain followed by lespedeza; third year, lespedeza.
2. First year, corn followed by winter cover; second year, corn followed by small grain and fescue; third year, small grain and fescue followed by lespedeza; fourth year, fescue and lespedeza.
3. First year, corn followed by small grain; second year, small grain followed by lespedeza.
4. First year, corn followed by winter cover; second year, corn or soybeans followed by small grain; third year, small grain followed by lespedeza.

The soils of this unit require potash and phosphate for high yields of all field crops and pasture plants, and they need nitrogen for high yields of nonlegumes. These soils generally need less fertilizer, however, than other soils of the county. Because they are naturally acid, lime is required for good growth of most crops. The soils ought to be limed when they are first cleared. Then soil tests should be made every 3 to 5 years to determine the needs for lime and fertilizer.

If these soils were used repeatedly for crops and the crop residues were removed or burned, the content of organic matter would be nearly depleted. The fertility of the soils and their available water capacity also would be reduced. In areas that are not flooded each year, turning under the crop residues and cover crops and adding manure will help to maintain the content of organic matter.

These soils are easy to till and can be tilled within a wide range of moisture content. In areas that are not drained, however, the soils are wet much of the year and tillage is likely to be impractical.

The frequency of flooding can be reduced by clearing and straightening and widening or deepening the main channels of the streams; building structures to retard the progress of floodwaters on selected tributaries of the main streams; protecting areas of the surrounding uplands to prevent excessive runoff and silting of streams; and using other practices to help protect the watershed.

These soils require drainage for most crops. Either open ditches or tile drains may be used.

Capability unit IIIw–2

In this unit are nearly level to gently sloping soils that are somewhat poorly drained to poorly drained. The soils are on uplands, on low stream terraces, and in positions where colluvium has accumulated. The surface layer is friable sandy loam that is 4 to 15 inches thick, and the subsoil is friable to very firm sandy clay, silty clay, and clay. The following soils are in this unit:

Colfax sandy loam, 2 to 6 percent slopes.
Warne and Roanoke fine sandy loams.

These soils are low to medium in content of organic matter. They are acid and are medium to low in natural fertility. Their subsoil is moderate to slow in permeability and is moderate in available water capacity. The soils generally are not eroded, and they sometimes receive overwash from soils in higher areas.

The soils in this unit occupy about 3,546 acres. About 13 percent of the acreage is cultivated, about 60 percent is in pasture, and about 26 percent is in trees.

Wetness limits the use of these soils for crops, but the soils are suited to corn, soybeans, small grains, and lespedeza. They are also suited to sorghum and milo grown for silage and to ladino clover, orchardgrass, and fescue grown for forage. They are not suited to tobacco, cotton, or alfalfa. These soils require a cover crop in winter to maintain fertility, the supply of organic matter, and the available water capacity. Suitable cropping systems follow:

1. First year, corn followed by small grain and fescue; second year, small grain and fescue followed by lespedeza or ladino clover; third year, fescue and legumes.
2. First year, corn followed by winter cover; second year, corn or soybeans followed by small grain and fescue; third year, small grain and fescue followed by lespedeza; fourth year, fescue and lespedeza.
3. First year, corn followed by small grain; second year, small grain followed by lespedeza; third year, lespedeza.
4. First year, corn followed by small grain; second year, small grain followed by lespedeza.

The soils in this unit require potash and phosphate for high yields of all crops, and they need nitrogen for high yields of nonlegumes. Because the soils are naturally acid, lime is required for good growth of most crops. These soils ought to be limed when they are first cleared. Then soil tests should be made every 3 to 5 years to determine the needs for lime and fertilizer.

Growing row crops continuously and removing or burning the crop residues would nearly deplete the supply of organic matter in these soils. The fertility and water-holding capacity would also be lowered. Turning under

the crop residues and cover crops and adding manure would help to maintain the supply of organic matter.

These soils are fairly easy to till. In many places, however, they stay wet for long periods unless proper drainage is provided. In the wet areas the soils should not be tilled, because they will puddle.

These soils require artificial drainage for most crops. Open ditches are suitable for drainage.

The Warne and Roanoke fine sandy loams are flooded infrequently when streams overflow their banks. The flooding can be reduced by clearing and straightening and widening or deepening the main channel of the streams; building structures to retard the floodwaters on selected tributaries of the main streams; protecting the surrounding soils of the uplands to prevent excessive runoff and silting of streams; and using other practices to protect the watershed.

The flow of water over the Colfax soil can be reduced by cultivating on the contour; constructing terraces that empty into sodded waterways; stripcropping; growing close-growing sod crops on the steep slopes or keeping a cover of trees on them; and using other practices on the surrounding soils of the uplands to prevent excessive runoff.

Capability unit IIIs–1

Only one soil—Buncombe loamy sand—is in this unit. It is a nearly level, excessively drained, very sandy soil of first bottoms. The surface layer is loamy sand, and the soil is sandy throughout the profile.

This soil is low in organic matter and in natural fertility. It is rapid in permeability and is low in available water capacity. The soil is droughty and is little eroded. It is likely to be flooded occasionally, and in places it receives overwash when the streams overflow.

The soil in this unit occupies 1,189 acres. About 45 percent of the acreage is cultivated, and the rest is in trees.

Low fertility, droughtiness, and the hazard of overflow somewhat limit the use of this soil for crops. The soil is better suited to corn, lespedeza, and pasture crops than to other crops. It is not suited to tobacco, cotton, and alfalfa. This soil requires a cover crop in winter to maintain its fertility, available water capacity, and supply of organic matter. Suitable cropping systems follow:

1. First year, corn followed by small grain and fescue; second year, small grain and fescue; third year, fescue and annual lespedeza.
2. First year, corn followed by winter cover; second, third, fourth, and fifth years, sericea lespedeza.
3. First year, corn followed by small grain; second year, small grain followed by annual lespedeza; third year, annual lespedeza.
4. First year, corn followed by small grain; second year, small grain followed by crotalaria.

Potash and phosphate are required for good yields of all crops grown on this soil, and nitrogen is required for good yields of nonlegumes. Lime is also required for good yields, but the soil should not be overlimed. The soil ought to be tested before lime or fertilizer is applied. The fertilizer probably should be added frequently in small applications for crops to make the most efficient use of it and to reduce loss of plant nutrients by leaching. Tests should be made of this soil every 3 to 5 years to determine the needs for lime and fertilizer.

Growing crops continuously and removing or burning the crop residues would nearly deplete the supply of organic matter in this soil. The fertility and available water capacity would also be lowered. Turning under crop residues and cover crops and adding a large amount of barnyard manure each year will help to maintain the supply of organic matter and increase yields. The content of organic matter cannot be built to a high level, however, because organic matter oxidizes rapidly in this porous soil.

This soil is easy to till and can be tilled within a wide range of moisture content. The hazard of flooding can be reduced by clearing and widening or deepening the channel of the major streams to increase the flow capacity and by building structures to retard the progress of floodwaters on selected tributaries of the streams. It can also be reduced by applying practices to control erosion on surrounding soils of uplands that are farmed. This will help to control excessive runoff and silting of the stream channels and basins where the floodwaters are stored. Other suitable practices to protect the watershed should also be used.

Capability unit IVe–1

In this unit are strongly sloping, well-drained soils that are coarse textured and friable. The soils are generally in the uplands on slopes that border drainageways. Their surface layer is friable sandy loam or fine sandy loam and is 3 to 10 inches thick. The subsoil is friable or firm sandy clay to clay. The following soils are in this unit:

Appling sand loam, 10 to 15 percent slopes.
Appling sandy loam, 10 to 15 percent slopes, eroded.
Cecil fine sandy loam, 10 to 15 percent slopes.
Cecil fine sandy loam, 10 to 15 percent slopes, eroded.
Cecil sandy loam, 10 to 15 percent slopes.
Cecil sandy loam, 10 to 15 percent slopes, eroded.
Cecil gravelly fine sandy loam, 10 to 15 percent slopes.
Cecil gravelly fine sandy loam, 10 to 15 percent slopes, eroded.
Cecil stony fine sandy loam, 6 to 15 percent slopes, eroded.
Lloyd fine sandy loam, 10 to 15 percent slopes.
Lloyd fine sandy loam, 10 to 15 percent slopes, eroded.
Madison gravelly fine sandy loam, 10 to 15 percent slopes.
Madison gravelly fine sandy loam, 10 to 15 percent slopes, eroded.

These soils are low in organic matter. They are low to medium in natural fertility and are medium acid to strongly acid. Their subsoil is moderate in permeability and in available water capacity. In the areas that have been cleared, most of the acreage is moderately eroded.

The soils of this unit occupy about 35,700 acres. About 30 percent of the acreage is cultivated, approximately 61 percent is in trees, and most of the rest is in pasture.

These soils are suited to corn, tobacco, cotton, soybeans, lespedeza, truck crops, small grains, and other crops. They are also suited to ladino clover, alfalfa, fescue, and orchardgrass grown for forage. If these soils are cultivated, they are highly susceptible to erosion. Practices are required to help control erosion, and a suitable cropping system is needed to protect them. Suitable cropping systems follow:

1. First year, corn or cotton followed by small grain and fescue; second year, small grain and fescue followed by lespedeza; third and fourth years, fescue followed by lespedeza.

2. First year, tobacco followed by small grain and fescue; second year, small grain and fescue; third year, fescue.
3. First year, small grain followed by lespedeza; second year, lespedeza.

The soils in this unit require potash and phosphate for high yields of all crops and pasture plants. They need nitrogen for high yields of nonlegumes, and boron for good stands of alfalfa. Generally, lime is required to raise the pH of the soils to a level suitable for good growth of crops. The soils ought to be tested every 3 to 5 years to determine the needs for lime and fertilizer.

Removing or burning the residues of crops would nearly deplete the supply of organic matter in these soils. The fertility and available water capacity would also be lowered, and the soils would become harder to work. Turning under crop residues and cover crops and adding manure will help to maintain the supply of organic matter. It is not feasible, however, to build the supply of organic matter to a high level because oxidation is rapid.

Generally, these soils are easy to till, but some of them contain enough gravel to hinder tillage slightly. Also, the soils in which the plow layer consists mostly of material from the subsoil, or those in which the supply of organic matter has not been maintained, are less easy to till. The soils that are not eroded can be tilled within a wide range of moisture content. The soils that are eroded can be tilled only within a narrow range of moisture content, and it is difficult to get a good stand of crops on them. If the eroded soils are worked when wet, they puddle and crust.

Sheet erosion is the chief hazard when these soils are cultivated. To help control erosion, cultivate on the contour, use stripcropping, and, when row crops are grown, choose a cropping system that includes close-growing crops. Because of their steep slopes, the soils in this unit are not suitable for sprinkler irrigation.

Capability unit IVe-2

In this unit are strongly sloping, well-drained soils that are medium textured to fine textured and friable. The soils are in rolling or gently rolling areas on ridges or side slopes in the uplands, and some areas are on side slopes that border drainageways. Their surface layer is friable loam, sandy clay loam, or loam, and their subsoil is friable or firm sandy clay to clay. The following soils are in this unit:

Appling sandy clay loam, 6 to 10 percent slopes, severely eroded.
Cecil clay loam, 6 to 10 percent slopes, severely eroded.
Lloyd loam, 10 to 15 percent slopes.
Lloyd loam, 10 to 15 percent slopes, eroded.
Lloyd clay loam, 6 to 10 percent slopes, severely eroded.

These soils are medium to low in organic matter. They are also acid and are low to medium in natural fertility. The subsoil is moderate in permeability and in available water capacity. In areas that have been cleared, most of the acreage is moderately eroded or severely eroded.

The soils in this unit occupy about 18,100 acres. Approximately 28 percent of the acreage is cultivated, about 50 percent is in trees (fig. 3), and most of the rest is in pasture.

These soils are suited to corn, cotton, small grains, soybeans, lespedeza, and other crops. They are also suited to alfalfa, ladino clover, fescue, and orchardgrass grown for forage, but varieties of good-quality, flue-cured tobacco do not grow well. The soils can be used for row crops if necessary, but they are highly susceptible to erosion when they are cultivated. If they are used for cultivated crops, practices are required to help control erosion, and a suitable cropping system is needed to protect them. Suitable cropping systems follow:

Figure 3.—**Four-year-old stand of loblolly pine on Cecil clay loam, 6 to 10 percent slopes, severely eroded. This soil is severely eroded because it has been cultivated intensively.**

1. First year, small grain and fescue followed by lespedeza and red clover; second and third years, fescue and legumes.
2. First year, corn or cotton followed by small grain and fescue; second year, small grain and fescue followed by lespedeza and red clover; third year, fescue and legumes.
3. First year, small grain followed by lespedeza; second year, lespedeza.
4. First year, corn followed by small grain and fescue; second year, small grain and fescue followed by lespedeza.

Potash and phosphate are required for high yields of all crop and pasture plants grown on these soils, and nitrogen is needed for high yields of nonlegumes. The soils need boron to produce good stands of alfalfa. Generally, they need lime for improved yields, especially in areas that have just been cleared. These soils ought to be tested every 3 to 5 years to determine the needs for lime and fertilizer.

Growing row crops repeatedly and removing or burning the crop residues would nearly deplete the supply of organic matter in these soils. The fertility and available water capacity would also be lowered, and the soils would be harder to work. Turning under crop residues and cover crops and adding manure will help to maintain the supply of organic matter. It is not feasible, however, to build the supply of organic matter to a high level, because it oxidizes rapidly in these soils.

The severely eroded soils in this unit are difficult to till, and it is hard to obtain a good stand of crops on them. They should not be tilled when too wet or too dry, because they will puddle or clod.

Sheet erosion is the chief hazard when these soils are cultivated. To help control erosion, cultivate on the contour, use stripcropping, and when row crops are grown choose a cropping system that includes close-growing crops.

Because of their steep slopes or because they take in water fairly slowly, the soils in this unit are not suited to irrigation.

Capability unit IVe–3

In this unit are sloping and strongly sloping, somewhat poorly drained to well-drained, mostly shallow soils that are compact, fine textured, and plastic. These soils of uplands are in rolling or gently rolling areas on ridges or side slopes, or they are on side slopes that border drainageways. Their surface layer is loamy sand to clay loam and is 4 to 12 inches thick. Their subsoil is friable sandy loam to very firm clay. The following soils are in this unit:

Iredell loam, 6 to 10 percent slopes, eroded.
Louisburg and Louisa soils, 6 to 10 percent slopes.
Mecklenburg loam, 10 to 15 percent slopes, eroded.
Mecklenburg clay loam, 6 to 15 percent slopes, severely eroded.
Wilkes soils, 6 to 10 percent slopes.

These soils are low in organic matter. They are medium to low in fertility and are strongly acid. Permeability is rapid to slow, and the available water capacity is low to medium. In areas that have been cleared, some of the soils are severely eroded.

The soils of this unit occupy about 2,400 acres. Approximately 12 percent is cultivated, about 58 percent is in trees, and most of the rest is not now used for agriculture.

These soils are suited to corn, cotton, small grains, lespedeza, soybeans, and other crops. They are well suited to ladino clover, fescue, and orchardgrass grown for forage. Some of the areas of the Louisburg, Louisa, and Wilkes soils are suited to flue-cured tobacco. The soils in this unit generally are not suited to alfalfa. They can be used for crops of high value if necessary, but they are highly susceptible to erosion when they are cultivated. If the soils are used for cultivated crops, practices are required to control erosion, and a suitable cropping system is required to help protect them. Suitable cropping systems follow:

1. First year, small grain and fescue followed by lespedeza or red clover; second, third, and fourth years, fescue followed by legumes.
2. First year, tobacco followed by small grain and fescue; second year, small grain and fescue; third and fourth years, fescue.
3. First year, corn or cotton followed by small grain and fescue; second year, small grain and fescue followed by lespedeza; third year, fescue and lespedeza.
4. First year, tobacco followed by small grain and fescue; second year, small grain and fescue.

These soils need potash and phosphate for high yields of all field crops and pasture plants and nitrogen for high yields of all nonlegumes. Generally, they need lime for improved yields of crops, especially in areas that have just been cleared. The soils ought to be tested every 3 to 5 years to determine the needs for lime and fertilizer.

Repeatedly removing or burning the residues of crops would nearly deplete the supply of organic matter in these soils. The fertility and available water capacity would also be lowered, and the soils would be hard to work. Turning under crop residues and cover crops and adding manure will help to maintain the supply of organic matter. It is not feasible, however, to build the supply of organic matter to a high level, because it oxidizes rapidly in these soils.

Some of these soils are easy to till, but for others tillage is difficult. Some can be tilled within a wide range of moisture content, and others can be tilled only within a narrow range.

Sheet erosion is the chief hazard when the soils are cultivated. To help control loss of soil and water, till on the contour, use stripcropping, and, when row crops are grown, choose a cropping system that includes close-growing crops.

These soils are not suitable for irrigation.

Capability unit IVw–1

In this unit are nearly level, poorly drained soils of first bottoms and stream terraces. Their surface layer is friable fine sandy loam to silt loam and is 3 to 8 inches thick. The subsoil is friable silt loam to firm clay. The following soils are in this unit:

Mixed alluvial land, wet.
Wehadkee silt loam.

These soils are normally medium in content of organic matter. They are medium in natural fertility and are normally strongly acid. The subsoil is rapid to slow in permeability and moderate to low in available water capacity. These soils are not subject to erosion. They occasionally receive overwash when the streams overflow, and in places they sometimes receive local deposits of alluvium and colluvium washed from surrounding higher lying soils of the uplands and terraces.

The soils in this capability unit occupy about 4,000 acres. Little of the acreage is cultivated; about 30 percent is in pasture, and about 53 percent is in trees.

Because of the hazard of overflow and wetness, use of these soils for crops is restricted. If they are drained and protected from flooding, the soils are suited to corn, soybeans, small grains, and lespedeza. They are also suited to sorghum, milo, and other crops grown for silage, and to fescue and other crops grown for forage. The soils are not suited to tobacco, alfalfa, or cotton. They require a winter cover crop that will help to maintain good tilth, fertility, and the available water capacity. Suitable cropping systems follow:

1. First year, corn followed by small grain and fescue; second year, small grain followed by lespedeza or ladino clover; third and fourth years, fescue and legumes.
2. First year, corn followed by winter cover; second year, corn or soybeans followed by small grain and fescue; third year, small grain and fescue followed by lespedeza or ladino clover; fourth year, fescue and legumes.
3. First year, corn followed by small grain; second year, small grain followed by lespedeza; third year, lespedeza.

4. First year, corn followed by winter cover; second year, soybeans followed by small grain; third year, small grain followed by lespedeza.

The soils in this unit require potash and phosphate for high yields of all crops, and nitrogen for high yields of nonlegumes. Because the soils are naturally highly acid, lime is needed for most crops. These soils ought to be limed when they are first cleared. Then soil tests should be made every 3 to 5 years to determine the needs for lime and fertilizer. Turning under crop residues and cover crops will help to maintain the supply of organic matter.

If these soils are not drained, they are wet much of the year. As a result, tillage is difficult and in places impossible. The frequency of overflow can be reduced by clearing and straightening and widening or deepening the main channel of the streams; by building structures on selected tributaries of the main streams; by protecting the surrounding soils of uplands to prevent excessive runoff and silting of the streams; and by using other practices to protect the watershed. These soils require artificial drainage for most crops. Drainage can be provided by open ditches.

Capability unit IVw-2

Only one soil—Worsham loam—is in this unit. It is a gently sloping, poorly drained soil from local alluvium and colluvium. The surface layer is friable loam that is 8 to 18 inches thick, and the subsoil is firm clay. The soil is shallow to deep over local alluvium and colluvium and has a poorly developed profile.

This soil is normally medium in organic matter. It is low in natural fertility and is medium acid to strongly acid. Permeability is moderate to moderately slow, and the available water capacity is moderate. Occasionally, this soil receives deposits of local alluvium and colluvium from surrounding higher lying soils of the uplands.

This soil occupies about 750 acres. About 20 percent of the acreage is cultivated, and 70 percent is in trees. The rest is in various uses.

Wetness restricts use of this soil for crops. The soil is suited to corn, soybeans, lespedeza, and small grains. It is also suited to sorghum, milo, and other silage crops, and to fescue, ladino clover, and other forage crops. Suitable cropping systems follow:

1. First year, corn followed by small grain and fescue; second year, small grain followed by lespedeza or ladino clover; third and fourth years, fescue and legumes.
2. First year, corn followed by winter cover; second year, corn or soybeans followed by small grain and fescue; third year, small grain and fescue followed by lespedeza or ladino clover; fourth year, fescue and legumes.
3. First year, corn followed by small grain; second year, small grain followed by lespedeza; third year, lespedeza.
4. First year, corn followed by winter cover; second year, soybeans followed by small grain; third year, small grain followed by lespedeza.

The soil in this unit requires potash and phophate for high yields of all crops, and nitrogen for high yields of nonlegumes. Because of natural acidity, it needs lime for good yields of most crops. This soil ought to be limed when it is first cleared. Then soil tests should be made every 3 to 5 years thereafter to determine the needs for lime and fertilizer.

Growing row crops continuously and removing or burning the crop residues would lower the supply of organic matter in this soil considerably. It would also lower the fertility and available water capacity. Turning under crop residues and cover crops will help to maintain the supply of organic matter.

Areas of this soil that are not drained remain wet much of the year. In these places tillage is difficult; it should not be attempted if the soil is too wet or too dry, for the soil will puddle or clod.

The chief problems in managing this soil are the high water table that causes excess water in the profile from runoff from surrounding higher lying soils during heavy rainfall, and seepage water from the higher lying soils. Runoff can be reduced by tilling on the contour, strip-cropping, and constructing terraces that empty into sodded waterways. Also, plant close-growing sod crops, trees or other permanent cover, or use ditches to divert runoff from surrounding higher lying soils. Excess water in the profile can be removed by using open ditches to provide drainage.

Capability unit VIe-1

In this unit are moderately steep, well-drained soils. These soils are on the uplands on side slopes that border deeply cut drainageways. Their surface layer is friable sandy loam to loam and is 3 to 5 inches thick. Their subsoil is friable or firm sandy clay to clay. The following soils are in this unit:

Appling sandy loam, 15 to 25 percent slopes.
Appling sandy loam, 15 to 25 percent slopes, eroded.
Cecil soils, 15 to 25 percent slopes.
Cecil soils, 15 to 25 percent slopes, eroded.
Cecil gravelly fine sandy loam, 15 to 25 percent slopes.
Cecil gravelly fine sandy loam, 15 to 25 percent slopes, eroded.
Cecil stony fine sandy loam, shallow, 15 to 25 percent slopes.
Lloyd loam, 15 to 25 percent slopes.
Lloyd loam, 15 to 25 percent slopes, eroded.
Lloyd fine sandy loam, 15 to 25 percent slopes.
Lloyd fine sandy loam, 15 to 25 percent slopes, eroded.
Madison gravelly fine sandy loam, 15 to 25 percent slopes.
Madison gravelly fine sandy loam, 15 to 25 percent slopes, eroded.

These soils are medium to low in organic matter. They are low to medium in natural fertility and are medium acid to strongly acid. The subsoil is moderate in permeability and in available water capacity. In most areas that have been cleared, these soils are moderately eroded.

The soils in this unit occupy about 34,000 acres. Approximately 16 percent of the acreage is in pasture, about 76 percent is in forest, and most of the rest is cultivated.

Because of their strong slopes, these soils are generally not suited to row crops. They are suited to ladino clover, fescue, orchardgrass and other pasture plants, and to trees.

The soils are highly susceptible to erosion if they are not adequately protected. It is better to use them for permanent pasture or for perennial grasses and legumes for hay than for row crops.

The soils in this unit require potash and phosphate for good yields of pasture plants, and they require nitrogen

for high yields of all nonlegumes. Sometimes nitrogen is also needed to start legumes. On these soils lime generally is required to raise the pH to a level suitable for high yields of forage crops. The soils ought to be tested every 3 to 5 years to determine the needs for lime and fertilizer. Preventing overgrazing and seeding the pastures without plowing help to maintain the supply of organic matter.

The hazard of erosion and loss of water are the main problems in managing these soils. Keeping a cover of permanent pasture or trees on the soils will provide adequate protection.

Capability unit VIe–2

In this unit are strongly sloping, well-drained soils that are medium textured. These soils are on the uplands and are generally on side slopes that border soils of the bottom lands or are above slopes that border those areas. They have lost three-fourths or more of their original surface layer through erosion. The present surface layer is friable clay loam or sandy clay loam and is as much as 4 inches thick. The subsoil is sandy clay or clay that is friable or firm. The following soils are in this unit:

Appling sandy clay loam, 10 to 15 percent slopes, severely eroded.
Cecil clay loam, 10 to 15 percent slopes, severely eroded.
Lloyd clay loam, 10 to 15 percent slopes, severely eroded.

These soils are low in organic matter and in natural fertility. They are acid and are moderate in permeability and in available water capacity. All of the soils have been cleared or cultivated, but many areas now support only native grasses, weeds, or pines.

The soils in this unit occupy about 11,000 acres. Approximately 10 percent of the acreage is cultivated, about 20 percent is in pasture, and about 65 percent is in trees.

Because they are severely eroded and strongly sloping, these soils are generally not suited to row crops. They are suited to ladino clover, fescue, orchardgrass, and other pasture plants, and they are also suited to alfalfa, lespedeza, and other hay crops. Using these soils for permanent pastures of ladino clover and fescue or for hay or peremnial grasses and legumes will help to protect them from erosion.

The soils in this unit require potash and phosphate for good yields of pasture plants, and nitrogen for high yields of all nonlegumes. Nitrogen is also usually required to start legumes. These soils generally need enough lime to raise the pH to a level suitable for good crop growth. The soils ought to be tested every 3 to 5 years to determine the needs for lime and fertilizer. Preventing overgrazing and seeding the pastures without plowing will help to maintain a sufficient supply of organic matter.

These soils are somewhat difficult to till because of the fine texture of their surface layer. Good stands of grasses and legumes are difficult to obtain unless the site is especially prepared. The main hazards are excessive loss of soil and water. Keeping a cover of permanent pasture or trees on the soils will provide adequate protection.

Capability unit VIe–3

In this unit are strongly sloping soils that have little or no horizon differentiation and are shallow over bedrock. These well-drained soils are in the uplands and are generally on side slopes that border drainageways. Their surface layer is friable sandy loam to sandy clay loam and is 3 to 15 inches thick. The B horizon, if present, ranges from sandy loam to clay. The following soils are in this unit:

Louisburg and Louisa soils, 10 to 15 percent slopes.
Wilkes soils, 10 to 15 percent slopes.

These soils are low in organic matter and in natural fertility. They are medium acid to strongly acid and are low to very low in available water capacity. In areas that have been cleared, some of the acreage is moderately eroded.

The soils in this unit occupy about 1,600 acres. Approximately 10 percent of the acreage is cultivated, about 15 percent is in pasture, and about 70 percent is in trees.

Because they are shallow over bedrock and are highly susceptible to erosion, these soils are not suited to cultivation. They are fairly well suited to ladino clover, fescue, orchardgrass and other pasture plants, and to trees. To provide adequate protection from erosion, it is necessary to use these soils for permanent pasture, such as ladino clover and fescue, or for some less intensive use.

The soils in this unit require potash and phosphate for good yields of pasture plants, and nitrogen for good yields of nonlegumes. Nitrogen also is usually required to start legumes. These soils generally need lime to raise the pH to a level suitable for high yields of crops. The soils ought to be tested every 3 to 5 years to determine the needs for lime and fertilizer. Seeding pasture without plowing, and preventing overgrazing, will help to maintain a sufficient level of organic matter.

These soils are generally easy to till. Accelerated erosion is the main hazard. Keeping a cover of permanent pasture or trees on the soils helps to control losses of soil and water.

Capability unit VIIe–1

In this unit are steep, stony soils that are well drained and are shallow over bedrock. The soils are in the uplands or on side slopes that border the major streams. Their surface layer is friable sandy loam to loam and is 3 to 5 inches thick. Their subsoil is friable or firm loamy sand to clay. The following soils are in this unit:

Cecil soils, 25 to 45 percent slopes.
Cecil soils, 25 to 45 percent slopes, eroded.
Cecil stony fine sandy loam, shallow, 25 to 55 percent slopes.
Louisburg and Louisa soils, 25 to 55 percent slopes.
Louisburg and Louisa soils, 15 to 25 percent slopes.
Madison gravelly fine sandy loam, 25 to 45 percent slopes.
Wilkes soils, 15 to 25 percent slopes.
Wilkes soils, 25 to 55 percent slopes.

These soils are low in organic matter. They are low to medium in natural fertility and are medium acid to strongly acid. Their subsoil is rapid to moderate in permeability and low to moderate in available water capacity. Little of the acreage has been cleared, and not much erosion has occurred.

The soils in this unit occupy about 21,650 acres. Less than 1 percent of the acreage is cultivated, about 9 percent is in pasture, and about 88 percent is in trees.

Because of droughtiness and steep slopes, the soils in this unit are poorly suited to row crops or pasture. They are better suited to trees.

These soils should not be tilled. They are highly susceptible to erosion, and water is lost through runoff if they are not adequately protected. Keeping the soils in trees and preventing forest fires help to maintain the supply of organic matter. These practices also help to control erosion and excessive loss of water.

Capability unit VIIe-2

In this unit are gently sloping to moderately steep soils that are severely eroded, and land that is moderately to severely gullied. The soils are well drained. They are in moderately steep areas next to deeply cut drainageways and in all other areas that have been moderately or severely gullied. Their surface layer is friable or firm clay loam to clay. The subsoil is friable or firm sandy clay to clay. The following soils are in this unit:

Cecil clay loam, 15 to 25 percent slopes, severely eroded.
Lloyd clay loam, 15 to 25 percent slopes, severely eroded.
Moderately gullied land, rolling.
Moderately gullied land, hilly.
Severely gullied land.

The soils in this unit are low in organic matter. They are medium in natural fertility and are acid. The subsoil is moderate in permeability and moderate to low in available water capacity.

The soils occupy about 16,750 acres. About 5 percent of the acreage is cultivated, about 11 percent is in pasture, and about 80 percent is in trees.

These soils are severely eroded and are not suited to row crops and pasture. They are suited only to trees, shrubs, or kudzu.

TABLE 1.—*Estimated average acre yields of the*

[Yields in columns A are those obtained under common management practices; those in columns B are yields

Soil	Pasture		Lespedeza	
	A	B	A	B
	Acres per animal unit [1]	*Acres per animal unit* [1]	*Tons*	*Tons*
Altavista fine sandy loam, 2 to 6 percent slopes	2.7	1.7	1.0	[2] 1.4
Altavista fine sandy loam, 2 to 6 percent slopes, eroded	2.7	1.7	.9	[2] 1.2
Appling sandy loam, 2 to 6 percent slopes	2.7	1.7	1.1	1.5
Appling sandy loam, 2 to 6 percent slopes, eroded	2.7	1.7	1.1	1.5
Appling sandy loam, 6 to 10 percent slopes	2.7	1.7	1.1	1.5
Appling sandy loam, 6 to 10 percent slopes, eroded	2.7	1.7	.9	1.5
Appling sandy loam, 10 to 15 percent slopes	3.2	2.2	.8	1.2
Appling sandy loam, 10 to 15 percent slopes, eroded	3.2	2.2	.6	1.0
Appling sandy loam, 15 to 25 percent slopes	3.7	2.7		
Appling sandy loam, 15 to 25 percent slopes, eroded	3.7	2.7		
Appling sandy clay loam, 6 to 10 percent slopes, severely eroded	3.7	2.7	.5	.7
Appling sandy clay loam, 10 to 15 percent slopes, severely eroded	4.0	3.0		
Buncombe loamy sand [3]	4.0	3.0		
Cecil fine sandy loam, 2 to 6 percent slopes	2.5	1.5	1.3	1.7
Cecil fine sandy loam, 2 to 6 percent slopes, eroded	2.5	1.5	1.3	1.7
Cecil fine sandy loam, 6 to 10 percent slopes	2.5	1.5	1.3	1.7
Cecil fine sandy loam, 6 to 10 percent slopes, eroded	2.5	1.5	1.1	1.7
Cecil fine sandy loam, 10 to 15 percent slopes	3.0	2.0	1.0	1.5
Cecil fine sandy loam, 10 to 15 percent slopes, eroded	3.0	2.0	.8	1.3
Cecil sandy loam, 2 to 6 percent slopes	2.7	1.7	1.2	1.6
Cecil sandy loam, 2 to 6 percent slopes, eroded	2.7	1.7	1.2	1.6
Cecil sandy loam, 6 to 10 percent slopes	2.7	1.7	1.2	1.6
Cecil sandy loam, 6 to 10 percent slopes, eroded	2.7	1.7	1.0	1.6
Cecil sandy loam, 10 to 15 percent slopes	3.2	2.2	.9	1.4
Cecil sandy loam, 10 to 15 percent slopes, eroded	3.2	2.2	.7	1.2
Cecil soils, 15 to 25 percent slopes	3.7	2.7		
Cecil soils, 15 to 25 percent slopes, eroded	3.7	2.7		
Cecil soils, 25 to 45 percent slopes				
Cecil soils, 25 to 45 percent slopes, eroded				
Cecil gravelly fine sandy loam, 2 to 6 percent slopes	2.5	1.5	1.3	1.7
Cecil gravelly fine sandy loam, 2 to 6 percent slopes, eroded	2.5	1.5	1.3	1.7
Cecil gravelly fine sandy loam, 6 to 10 percent slopes	2.5	1.5	1.3	1.7
Cecil gravelly fine sandy loam, 6 to 10 percent slopes, eroded	2.5	1.5	1.1	1.7
Cecil gravelly fine sandy loam, 10 to 15 percent slopes	3.0	2.0	1.0	1.5
Cecil gravelly fine sandy loam, 10 to 15 percent slopes, eroded	3.0	2.0	.8	1.3
Cecil gravelly fine sandy loam, 15 to 25 percent slopes	3.5	2.5		
Cecil gravelly fine sandy loam, 15 to 25 percent slopes, eroded	3.5	2.5		
Cecil stony fine sandy loam, 6 to 15 percent slopes, eroded	2.7	1.7	1.0	1.5
Cecil stony fine sandy loam, shallow, 15 to 25 percent slopes	3.0	2.0		
Cecil stony fine sandy loam, shallow, 25 to 55 percent slopes				
Cecil clay loam, 6 to 10 percent slopes, severely eroded	3.7	2.7	.5	.7
Cecil clay loam, 2 to 6 percent slopes, severely eroded	3.5	2.5	.5	.7
Cecil clay loam, 10 to 15 percent slopes, severely eroded	4.0	3.0		
Cecil clay loam, 15 to 25 percent slopes, severely eroded				
Chewacla soils [3]	2.0	1.2	1.4	[2] 1.8

See footnotes at end of table.

These soils should not be tilled. If they are not adequately protected, they are highly susceptible to further erosion. Planting trees and preventing forest fires will help to maintain the supply of organic matter. The trees also provide adequate protection after they become established, except in areas where there is active gullying. In these places sericea lespedeza or kudzu can be planted in the gullies, or other special practices to protect the soils can be used.

Estimated Yields

Table 1 gives the estimated acre yields for the principal crops grown in Iredell County. The estimates are based on the assumption that the same kinds of crops are grown throughout the county, that the climate is relatively constant, and that differences in yields are the result of differences in the soils and in the kind of management. In columns A are yields to be expected under the management generally used in the county. The yields in columns B are those to be expected under improved management.

The estimates are based on a growing season of 195 days and on an average annual grazing period of 7 months for permanent pastures. They are for crops that were grown in seasons of normal rainfall and that were not irrigated. In this county rainfall is generally sufficient to meet the needs of crops, but short periods of drought are common during the summer. In some years drought lasts 20 or more days and yields of most crops grown in summer are considerably reduced. Because rainfall is almost always adequate in fall and winter, yields of wheat, oats, and other small grains are dependable from year to year.

principal crops under two levels of management

to be expected under the best management practices feasible. Dashed lines indicate crop is not commonly grown]

Alfalfa		Corn		Oats		Wheat		Cotton (lint)		Tobacco	
A	B	A	B	A	B	A	B	A	B	A	B
Tons	*Tons*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Pounds*	*Pounds*	*Pounds*	*Pounds*
		45	75	35	65	20	35	300	450	1, 000	[2] 1, 300
		40	70	30	60	15	30	300	450	1, 000	[2] 1, 300
2. 5	3. 0	40	70	35	65	20	35	350	500	1, 400	2, 000
2. 5	3. 0	35	65	30	60	15	30	325	450	1, 200	1, 700
2. 5	3. 0	40	70	35	65	20	35	350	500	1, 350	1, 925
2. 3	2. 8	35	65	30	60	15	30	325	450	1, 150	1, 625
2. 3	2. 8	35	65	30	60	15	30	325	450	1, 300	1, 875
2. 1	2. 6	30	60	25	55	10	25	300	425	1, 100	1, 575
		25	50	25	50	10	25	250	350		
		20	40	20	40	10	20				
		25	40	25	40						
2. 8	3. 3	45	80	40	70	25	40	400	600	1, 500	2, 100
2. 8	3. 3	40	75	35	65	20	35	375	575	1, 300	1, 800
2. 8	3. 3	45	80	40	70	25	40	400	600	1, 450	2, 025
2. 6	3. 1	40	75	35	65	20	35	375	575	1, 250	1, 725
2. 6	3. 1	35	70	35	65	20	35	350	550	1, 400	1, 975
2. 4	2. 9	30	65	30	60	15	30	325	525	1, 200	1, 675
2. 7	3. 2	40	75	40	70	25	40	350	550	1, 400	2, 000
2. 7	3. 2	35	70	35	65	20	35	325	525	1, 200	1, 700
2. 7	3. 2	40	75	40	70	25	40	350	550	1, 350	1, 925
2. 5	3. 0	35	70	35	65	20	35	325	525	1, 150	1, 625
2. 5	3. 0	35	70	35	65	20	35	325	525	1, 300	1, 875
2. 3	2. 8	30	65	30	60	15	30	300	500	1, 100	1, 575
2. 8	3. 3	45	80	40	70	25	40	400	600	1, 500	2, 100
2. 8	3. 3	40	75	35	65	20	35	375	575	1, 300	1, 800
2. 8	3. 3	45	80	40	70	25	40	400	600	1, 450	2, 025
2. 6	3. 1	40	75	35	65	20	35	375	575	1, 250	1, 725
2. 6	3. 1	35	70	35	65	20	35	350	550	1, 400	1, 975
2. 4	2. 9	30	65	30	60	15	30	325	525	1, 200	1, 675
2. 6	[2] 3. 1	35	65	30	60	20	35	325	[2] 500	1, 150	[2] 1, 675
		20	40	25	50	10	20	250	350		
		25	50	25	50	10	25	250	350		
		75	100	40	70						

TABLE 1.—*Estimated average acre yields of the*

[Yields in columns A are those obtained under common management practices; those in columns B are yields

Soil	Pasture		Lespedeza	
	A	B	A	B
	Acres per animal unit [1]	*Acres per animal unit* [1]	*Tons*	*Tons*
Colfax sandy loam, 2 to 6 percent slopes	2.5	1.5	0.7	[2] 1.0
Congaree soils [3]	2.0	1.2	1.4	[2] 1.8
Davidson clay loam, 2 to 6 percent slopes, eroded	2.4	1.4	1.6	2.0
Davidson clay loam, 6 to 10 percent slopes, eroded	2.4	1.4	1.6	2.0
Hiwassee loam, 2 to 6 percent slopes, eroded	2.4	1.4	1.6	2.0
Hiwassee loam, 6 to 10 percent slopes, eroded	2.4	1.4	1.6	2.0
Iredell loam, 2 to 6 percent slopes, eroded	3.0	1.7	.9	1.2
Iredell loam, 6 to 10 percent slopes, eroded	3.0	1.7	.7	1.0
Lloyd loam, 2 to 6 percent slopes	2.4	1.4	1.6	2.0
Lloyd loam, 2 to 6 percent slopes, eroded	2.4	1.4	1.6	2.0
Lloyd loam, 6 to 10 percent slopes	2.4	1.4	1.6	2.0
Lloyd loam, 6 to 10 percent slopes, eroded	2.4	1.4	1.4	1.8
Lloyd loam, 10 to 15 percent slopes	2.7	1.7	1.2	1.6
Lloyd loam, 10 to 15 percent slopes, eroded	3.0	2.0	1.0	1.4
Lloyd loam, 15 to 25 percent slopes	3.2	2.2		
Lloyd loam, 15 to 25 percent slopes, eroded	3.5	2.5		
Lloyd fine sandy loam, 2 to 6 percent slopes	2.5	1.5	1.5	1.9
Lloyd fine sandy loam, 2 to 6 percent slopes, eroded	2.5	1.5	1.5	1.9
Lloyd fine sandy loam, 6 to 10 percent slopes	2.5	1.5	1.5	1.9
Lloyd fine sandy loam, 6 to 10 percent slopes, eroded	2.5	1.5	1.3	1.8
Lloyd fine sandy loam, 10 to 15 percent slopes	3.0	2.0	1.1	1.6
Lloyd fine sandy loam, 10 to 15 percent slopes, eroded	3.0	2.0	.9	1.4
Lloyd fine sandy loam, 15 to 25 percent slopes	3.5	2.5		
Lloyd fine sandy loam, 15 to 25 percent slopes, eroded	3.5	2.5		
Lloyd clay loam, 6 to 10 percent slopes, severely eroded	3.7	2.7	.7	.9
Lloyd clay loam, 2 to 6 percent slopes, severely eroded	3.5	2.5	.7	.9
Lloyd clay loam, 10 to 15 percent slopes, severely eroded	4.0	3.0		
Lloyd clay loam, 15 to 25 percent slopes, severely eroded				
Local alluvial land	2.4	1.4	1.2	1.6
Louisburg and Louisa soils, 25 to 55 percent slopes				
Louisburg and Louisa soils, 6 to 10 percent slopes	3.5	2.5	.5	.9
Louisburg and Louisa soils, 10 to 15 percent slopes	4.0	3.0		
Louisburg and Louisa soils, 15 to 25 percent slopes				
Made land [4]				
Madison gravelly fine sandy loam, 2 to 6 percent slopes	2.7	1.7	1.2	1.6
Madison gravelly fine sandy loam, 2 to 6 percent slopes, eroded	2.7	1.7	1.2	1.6
Madison gravelly fine sandy loam, 6 to 10 percent slopes	2.7	1.7	1.2	1.6
Madison gravelly fine sandy loam, 6 to 10 percent slopes, eroded	2.7	1.7	1.0	1.6
Madison gravelly fine sandy loam, 10 to 15 percent slopes	3.2	2.2	.9	1.4
Madison gravelly fine sandy loam, 10 to 15 percent slopes, eroded	3.2	2.2	.7	1.2
Madison gravelly fine sandy loam, 15 to 25 percent slopes	3.7	2.7		
Madison gravelly fine sandy loam, 15 to 25 percent slopes, eroded	3.7	2.7		
Madison gravelly fine sandy loam, 25 to 45 percent slopes				
Mayodan sandy loam, 2 to 6 percent slopes, eroded	2.7	1.7	1.1	1.5
Mecklenburg loam, 2 to 6 percent slopes, eroded	2.7	1.5	.8	1.1
Mecklenburg loam, 6 to 10 percent slopes, eroded	2.7	1.5	.6	.9
Mecklenburg loam, 10 to 15 percent slopes, eroded	3.2	2.5	.5	.8
Mecklenburg clay loam, 6 to 15 percent slopes, severely eroded	4.0	3.0	.5	.8
Mixed alluvial land, wet [3]	4.5	3.0		
Mixed alluvial land [3]	3.0	2.0	1.2	[2] 1.6
Moderately gullied land, rolling				
Moderately gullied land, hilly				
Severely gullied land				
Starr loam	2.3	1.3	1.7	2.1
Warne and Roanoke fine sandy loams	3.5	2.5	.5	[2] .7
Wehadkee silt loam [3]	4.0	2.7	.4	[2] .7
Wickham fine sandy loam, 2 to 6 percent slopes, eroded	2.5	1.5	1.3	1.7
Wickham fine sandy loam, 2 to 6 percent slopes	2.5	1.5	1.3	1.7
Wickham fine sandy loam, 6 to 10 percent slopes, eroded	2.5	1.5	1.1	1.7
Wilkes soils, 6 to 10 percent slopes	3.0	2.0	.7	1.2
Wilkes soils, 10 to 15 percent slopes	3.5	2.5		
Wilkes soils, 15 to 25 percent slopes				
Wilkes soils, 25 to 55 percent slopes				
Worsham loam	3.5	2.5		

[1] The average number of acres required to furnish annually, without injury to the pasture, 205 days' grazing for one cow, steer, or horse; five hogs; or seven sheep or goats.

[2] The crop is generally not grown on this soil, but the soil is suited to it.

principal crops under two levels of management—Continued

to be expected under the best management practices feasible. Dashed lines indicate crop is not commonly grown]

Alfalfa		Corn		Oats		Wheat		Cotton (lint)		Tobacco	
A	B	A	B	A	B	A	B	A	B	A	B
Tons	*Tons*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Pounds*	*Pounds*	*Pounds*	*Pounds*
		35	65	30	60	15	30				
		75	100	40	70			300	[2] 500		
3.0	3.5	50	90	45	75	30	45	425	625		
2.8	3.3	45	85	45	75	30	45	425	625		
3.0	3.5	50	90	45	75	30	45	425	625		
2.8	3.3	45	85	45	75	30	45	425	625		
		25	45	25	45	15	25	250	400		
		20	40	20	40	10	20	225	375		
3.0	3.5	50	90	45	75	30	45	425	625		
3.0	3.5	45	85	40	70	25	40	410	610		
3.0	3.5	50	90	45	75	30	45	425	625		
2.8	3.3	45	85	40	70	25	40	410	610		
2.8	3.3	45	85	40	70	25	40	390	590		
2.6	3.1	40	80	35	65	20	35	370	570		
2.9	3.4	45	85	40	70	25	40	400	600		
2.9	3.4	40	80	35	65	20	35	375	575		
2.9	3.4	45	85	40	70	25	40	400	600		
2.7	3.2	40	80	35	65	20	35	375	575		
2.7	3.2	35	75	35	65	20	35	350	550		
2.5	3.0	30	70	30	60	15	30	325	525		
		25	50	25	50	10	20	250	350		
		25	50	25	50	10	25	250	350		
		50	90	40	70	20	35	350	550	1,200	1,700
		25	40	30	45	15	25	250	[2] 400	1,200	[2] 1,700
2.3	[2] 2.8	40	75	40	70	25	40	375	575	1,500	2,100
2.3	[2] 2.8	35	70	35	65	20	35	350	550	1,300	1,800
2.3	[2] 2.8	40	75	40	70	25	40	375	575	1,420	2,025
2.1	[2] 2.6	35	70	35	65	20	35	350	550	1,250	1,725
2.1	[2] 2.6	30	65	35	65	20	35	350	550	1,400	1,975
1.9	[2] 2.4	25	60	30	60	15	30	325	525	1,200	1,675
2.5	3.0	35	65	30	60	15	30	325	450	1,200	1,700
2.4	2.9	35	65	30	60	20	35	325	450		
2.2	2.7	30	60	25	55	20	35	325	450		
2.0	2.5	25	55	20	50	15	30	300	425		
		20	40	15	35	10	20	250	350		
		25	40								
		65	90								
3.2	3.7	50	90	45	75	30	45	425	625		
		25	40								
2.8	3.3	40	75	35	65	20	35	375	575	1,300	1,800
2.8	3.3	45	80	40	70	25	40	400	600	1,500	2,100
2.6	3.1	40	75	30	60	20	35	375	575	1,250	1,725
		25	45	35	50	20	35	250	400		
		25	40								

[3] Estimated yields are based on yields obtained during seasons in which no damaging floods occurred.
[4] Variable in slope and in degree of erosion.

The management practices on which the yields in columns B are based include the following:

1. Preparing a good seedbed.
2. Planting recommended varieties of seed.
3. Adding lime and fertilizer at the proper time and according to the needs indicated by soil tests.
4. Seeding or planting by suitable methods, at recommended rates, and on the recommended dates.
5. If necessary, inoculating legumes.
6. Controlling grazing.
7. Cutting hay at a recommended time.
8. Cultivating row crops according to approved practices.
9. Controlling weeds, diseases, and insects.
10. Using an approved cropping system that will help to conserve the soil.
11. When needed, installing the proper equipment, and using approved practices to conserve soil and water.

The management varies according to the soils, but all of these practices that apply ought to be followed if the yields in columns B are to be obtained.

In table 2 general rates for liming, fertilizing, and seeding are given for the principal crops grown in Iredell County. The rates are based on the results of soil tests made in the county from 1951 through 1953, which showed that 91 percent of the soils needed phosphate, 64 percent needed lime, and 61 percent needed potash. The rates were recommended in 1960 by the North Carolina Agricultural Extension Service, and they are generally needed to get the yields given in columns B of table 1. Our knowledge about soil fertility grows every year, however, and recommended practices change as we learn more about the soils. Thus the rates recommended at the time you read this report may be different from those given in table 2.

Woodland Uses of the Soils[1]

Originally, all the land area of Iredell County had a cover of forests. The forests consisted mainly of oak, hickory, yellow-poplar, gum, black walnut, sycamore, beech, elm, river birch, and other hardwoods. They also included a scattering of shortleaf and Virginia pines and a few eastern white pines and eastern redcedars. The forests were almost free of brushy undergrowth, but they contained some shrubs as well as muscadine grape and other woody vines. On the uplands and high terraces were scarlet, red, black, white, chestnut, and post oaks; shortleaf, Virginia, and white pines; and hickory, yellow-poplar, holly, and redcedar. In the understory were dogwood and sourwood. The low terraces and first bottoms had a cover of sycamore, beech, yellow-poplar, black walnut, hickory, red maple, elm, and holly. In addition, there were water, willow, white, and red oaks, and some pines.

The forests provided building material and fuelwood for the pioneers, but the early settlers destroyed most of the timber they cut when they cleared areas for their farms. They tilled their fields until the yields of crops declined because the natural fertility of the soils was exhausted. Then, they abandoned those fields and cleared new ones. The abandoned fields seeded naturally to pure or mixed stands of shortleaf and Virginia pines, depending upon the species that grew nearby. Later, the pines in many old fields were harvested to meet an increased demand for lumber, and the fields were again planted to crops. The practice of clearing the land and of growing cultivated crops, later abandoning the fields and allowing the natural vegetation to come in, and finally cutting the new stand and again clearing the areas for cultivated crops has continued until the present time. The most significant result has been the conversion of the major part of the original forests from hardwoods to stands of pine or mixed pine and hardwoods.

In 1959, approximately 43 percent of the total land area of the county, or 162,916 acres, was commercial forest land.[2] Except for 200 acres owned by the county or in municipal ownership and less than 50 acres owned by the State, all of this acreage was privately owned.

[1] JOHN E. WIGGINS, JR., woodland conservationist, Soil Conservation Service, assisted with this section.

[2] From a survey of conservation needs by the U.S. Dept. of Agr., that was made about the same time the soil survey was made.

TABLE 2.—*General liming, fertilizing, and seeding rates per acre for the principal crops grown*

Crop	Lime	Fertilizer at time of seeding	Fertilizer applied as a top-dressing or for annual maintenance	Seeding rate
	Tons			
Pasture	1 to 2	1,000 pounds of 2–12–12, 900 pounds superphosphate, and 200 pounds of muriate of potash.	500 pounds of 0 10 20	2 to 4 pounds of ladino clover and 10 to 12 pounds of orchardgrass or 8 to 10 pounds of tall fescue.
Lespedeza	1	400 pounds of 5–10–10	300 pounds of 0–14–14	20 to 40 pounds.
Alfalfa	1 to 2	1,000 pounds of 2 12 12 and 35 pounds of borax.	800 pounds of 0–10–20 and 25 pounds of borax.	5 to 30 pounds.
Corn [1]	1	400 pounds of 5 10 10	80 to 100 pounds of nitrogen	3½-foot rows, plants 10 inches apart in the row.
Oats	1	350 pounds of 6–12–6	30 to 45 pounds of nitrogen	2 bushels.
Wheat	1	350 pounds of 6 12–6	30 to 45 pounds of nitrogen	1½ bushels.
Cotton	1	500 pounds of 5 10 10	40 to 60 pounds of nitrogen	30 pounds.
Tobacco	½ to 1	1,000 pounds of 4–8–12	100 pounds of 8–0 24	3½-foot rows, plants 18 to 24 inches apart in the row.

[1] On soils that have high available moisture capacity, use at least the amount of nitrogen recommended as a topdressing.

In 1960, wood-processing plants in the county consisted of 25 sawmills, including 4 special-dimension mills; 19 furniture and fixture plants; and 2 plywood and veneer plants.[3] Operators of the plants bought 45 million board feet of sawtimber in 1960. Owners of woodlots sold a total of 60,000 cords of pulpwood in 1960. Most of the pulpwood was purchased by two pulp and paper companies, which operate three yards where pulpwood is processed.

Interest in woodland conservation is increasing among the farmers in the county. Many of the farmers have improved their woodland by planting trees, by thinning and harvesting the trees properly, and by using other good management practices. Federal programs have brought about an increase in the number of trees planted. In the 1958–59 planting season, for example, 1,013,000 trees were planted as compared to 392,000 in the 1957 58 season. This constituted about 1,000 acres in new stands. Approximately, 476,500 trees were planted during the 1960–61 planting season. Of these, 417,000 were loblolly pine; 17,000 were white pine; 14,000 were slash pine; 11,000 were shortleaf pine; 1,000 were Virginia pine; 500 were longleaf pine; 12,000 were yellow-poplar; 2,000 were Arizona cypress; and 2,000 were baldcypress. Loblolly pine accounted for approximately 90 percent of the total number of trees planted during the 1959–60 and 1960–61 planting seasons.

Major forest types

The woodland in this county is made up of many kinds of trees. Pure stands of shortleaf pine are mainly in the eastern half of the county, and almost pure stands of Virginia pine are in the northwestern part. Mixed stands of shortleaf and Virginia pines, of mixed pines and hardwoods, and of upland hardwoods occur throughout the county. Bottom-land hardwoods are along the streams and loblolly pines have been planted in many fields that were once used for crops.

The principal forest types that make up the present woodland consists of shortleaf pine, Virginia pine, loblolly pine, oak-hickory, oak-pine, and oak-gum-cypress.[4] Each forest type is discussed in the paragraphs that follow.

Shortleaf pine.—Forests of shortleaf pine consist of stands in which 50 percent or more of the cubic volume of timber, or the number of trees in the stand, is shortleaf and Virginia pines. Shortleaf pine predominates in the stand. This forest type occupies about 32 percent of the forested acreage in the county.

Shortleaf pine grows on soils of the uplands and on high stream terraces. It tolerates drier sites than most other kinds of pines, but in Iredell County it grows best on the Congaree, Chewacla, Starr, and other soils underlain by alluvium and colluvium. Few shortleaf pines are planted now, mainly because this species is susceptible to littleleaf disease (*3*).[5] Also, undesirable kinds of hardwoods generally take over after the shortleaf pines in the stand have been killed by littleleaf disease.

Virginia pine.—Forests of Virginia pine consist of stands in which 50 percent or more of the cubic volume, or number of trees in the stand, is Virginia and shortleaf pines. Virginia pine predominates in the stand. This type occupies about 13 percent of the forested acreage in the county.

Virginia pine grows on the same kinds of sites as shortleaf pine. It is more aggressive, however, and is better able to withstand adverse growing conditions in areas of soils that are badly gullied and severely eroded. Like shortleaf pine, Virginia pine grows best on well-drained soils in areas underlain by alluvium and colluvium. It seldom occurs in such areas, however, and is generally in the uplands. Virginia pine is much less tolerant of sites where the soil is wet and drainage is impeded than is loblolly pine (*8*).

Loblolly pine.—The forests where this type predominates are made up of pure stands of loblolly pine growing in plantations. About 2 percent of the forested acreage in Iredell County is planted to loblolly pine. The county is west of the commercial range of loblolly pine, and, except for possible scattered trees, loblolly pine is not native to the county.

Loblolly pine grows more rapidly than either shortleaf or Virginia pine on nearly all soils. In Iredell County it grows best, however, on soils underlain by alluvium and colluvium. Loblolly pine is more resistant to littleleaf disease than shortleaf pine, and it grows more rapidly (*3*). As a result, more loblolly is planted than other kinds of pines.

Oak-hickory.—In the oak-hickory forest type, 50 percent or more of the stand consists of upland oaks—scarlet, red, southern red, northern red, black, white, chestnut, and post oaks—and of hickory, yellow-poplar, gum, maple, and other hardwoods, except where pines comprise 25 to 49 percent of the stand (*4*). Trees of the oak-hickory forest type occupy about 38 percent of the forested acreage in the county.

The oak-hickory type of forest grows throughout the county, and the kinds of trees in the stands vary widely. Because stands of shortleaf and Virginia pines were cut indiscriminately, there are almost pure stands of hardwoods in many large areas. A number of these hardwoods are defective or are otherwise undesirable, and they have little commercial value. There are stands consisting of thrifty, sound yellow-poplars, red and white oaks, and other desirable trees in areas where the Cecil, Appling, Davidson, and Lloyd soils predominate and on other well-drained, friable soils of the uplands that are not eroded. Yellow-poplar, especially, is valuable commercially. Some 35 percent of the lumber that is made into furniture in North Carolina is yellow-poplar (*7*).

Oak-pine.—In the oak pine forest type, 50 percent or more of the stand consists of hardwoods, predominantly upland oaks. Shortleaf and Virginia pines make up 25 to 49 percent of the stand (*4*). Trees of this type occupy about 13 percent of the forested acreage in the county.

The oak-pine forest type resembles the oak-hickory type, except that the stands include considerably more pine.

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[3] From records of the Employment Security Commission of North Carolina, Statesville office.

[4] From information supplied by A. S. Todd, Jr., Southeastern Forest Experiment Station, Forest Service, U.S. Dept. of Agr., Asheville, N.C., to Joel Cawthorn, Soil Conservation Service, U.S. Dept. of Agr., Statesville, N.C., on April 4, 1961.

[5] Italic numbers in parentheses refer to Literature Cited, p. 95

Oak-gum-cypress.—In this forest type trees of the bottom lands make up 50 percent or more of the stand. The trees are mainly blackgum, sweetgum, oak, elm, and red maple in mixture with other associated species, except where pines comprise 25 to 49 percent of the stand (*4*). In Iredell County cypress is not a component of this forest type. Trees of the oak-gum-cypress forest type occupy 2 percent of the forested acreage in the county.

The kinds of trees in this forest type vary, depending upon drainage. On the well-drained soils of first bottoms and low terraces, the stands consist of yellow-poplar, sweetgum, ash, white and red oaks, hickory, and sycamore. On the poorly drained soils of first bottoms, the stands consist of black willow, river birch, blackgum, water and willow oaks, and red maple.

Woodland suitability groupings

To assist owners of woodland in planning the use of their soils, the soils of the county have been placed in woodland suitability groups. Each group is made up of soils that have about the same water-supplying capacity and other characteristics that influence the growth of trees. The soils also have similar limitations and are subject to the same hazards when used for trees. All the soils in one group, therefore, have about the same potential productivity for trees and they require the use of similar kinds of conservation practices and other management.

The groups are listed in table 3, and a general description of the soils in each group is given. For each group, site classes are given for trees that are important commercially. The site index is the total height of the dominant trees in the stand at 50 years of age, and it is a rating of potential productivity. Site indexes are grouped into site classes as follows:

	Site index
50	46 to 55
60	56 to 65
70	66 to 75
80	76 to 85
90	86 to 95
100	96 to 105

The site class given for each species in each suitability group is based on preliminary studies and is subject to change as additional data become available. Suitable species of trees, listed by priority for planting are also given in table 3.

TABLE 3.—*Woodland suitability grouping of soils*

Woodland group [1] and map symbols	Estimated site index [2] for—						Species priority for planting
	Loblolly pine	Shortleaf pine	White pine	Virginia pine	Yellow-poplar	Upland oaks	
Group 1. Deep, well-drained to somewhat poorly drained soils on first bottoms or in draws; the surface layer and the subsoil are moderately coarse textured to medium textured and are friable; in places the soils are subject to overflow, but the floodwaters do not remain long (Cw, Cy, Lo, Mm, St).	100—	80	100	80 +	100 +	90—	Loblolly pine, white pine, yellow-poplar, white or green ash, black walnut, sycamore, southern red oak, white oak.
Group 2. Deep, poorly drained or somewhat poorly drained soils on first bottoms and low terraces or in draws; the surface layer is moderately coarse textured to medium textured and is friable, and the subsoil is medium textured to fine textured and is friable or firm; these soils have a high water table or are subject to seepage or overflow (Mn, Wa, We, Wo).	90 -	80—	(3)	(3)	90	(3)	Loblolly pine, green ash, sycamore.
Group 3. Deep, well-drained to somewhat poorly drained soils of low terraces and low uplands; the surface layer is medium textured and friable, and the subsoil is moderately fine textured and firm.							
Subgroup 3A. Uneroded to slightly eroded soils that have a surface layer more than 6 inches thick (AfB, CxB).	80+	70—	80+	80 —	80 +	80+	Loblolly pine, shortleaf pine, white pine, yellow-poplar, black walnut, white oak, red oak, white ash.
Subgroup 3B. Moderately eroded soil that has a surface layer less than 6 inches thick; in places material from the former subsoil has been mixed into the surface layer (AfB2)	70+	60—	70—	70—	70—	70—	Loblolly pine, shortleaf pine, white pine, Virginia pine.

See footnotes at end of table.

TABLE 3.—*Woodland suitability grouping of soils*—Continued

Woodland group [1] and map symbols	Estimated site index [2] for—						Species priority for planting
	Loblolly pine	Shortleaf pine	White pine	Virginia pine	Yellow-poplar	Upland oaks	
Group 4. Deep or moderately deep, well-drained soils of uplands and terraces; the surface layer is moderately coarse textured to moderately fine textured and friable, and the subsoil is moderately fine textured to fine textured and is friable to firm.							
Subgroup 4A. Uneroded or slightly eroded soils that have a surface layer more than 6 inches thick (AsB, AsC, AsD, AsE, CfB, CfC, CfD, CgB CgC, CgD, CgE, CmB, CmC, CmD, CsE, CsF, CuE, CuF, LfB, LfC, LfD, LfE, LmB, LmC, LmD, LmE, MdB, MdC, MdD, MdE, MdF, WfB).	90—	70	90—	80—	80+	80	Loblolly pine, white pine, shortleaf pine, yellow-poplar, black walnut, eastern redcedar, red oak, white oak.
Subgroup 4B. Moderately eroded soils that have a surface layer less than 6 inches thick; in places the surface layer has clayey material from the former subsoil mixed into it (AsB2, AsC2, AsD2, AsE2, CfB2, CfC2, CfD2, CgB2, CgC2, CgD2, CgE2, CmB2, CmC2, CmD2, CsE2, CsF2, CtD2, DaB2, DaC2, HwB2, HwC2, LfB2, LfC2, LfD2, LfE2, LmB2, LmC2, LmD2, LmE2, MdB2, MdC2, MdD2, MdE2, MfB2, WfB2, WfC2).	80	60+	80+	70	70+	70—	Loblolly pine, white pine, shortleaf pine, eastern redcedar.
Subgroup 4C. Severely eroded soils that have a surface layer that is dominantly moderately fine textured to fine textured, and a subsoil that consists of clay loam and clay (AmC3, AmD3, CcB3, CcC3, CcD3, CcE3, LcB3, LcC3, LcD3, LcE3).	70—	50+	(3)	60	(3)	60—	Loblolly pine, Virginia pine.
Group 5. Moderately deep, well-drained soils of the uplands; the surface layer is medium textured and friable, and the subsoil is fine textured, firm to very firm, compact, and plastic.							
Subgroup 5A. Moderately eroded soils that have a surface layer less than 6 inches thick, and the surface layer in places contains clayey material from the former subsoil (MkB2, MkC2, MkD2).	70+	50+	70	60	(3)	60—	Loblolly pine, white pine, eastern redcedar.
Subgroup 5B. Severely eroded soils that have a surface layer that is dominantly clay loam and clay; shallow gullies are common (MhD3).	60	50	60	50	(3)	(3)	Loblolly pine, Virginia pine.
Group 6. Shallow, well-drained soils of the uplands; the surface layer is coarse textured to medium textured, and the subsoil has little or no development; depth to parent material of weathered rock is variable (LuC, LuD, LuE, LuF, WkC, WkD, WkE, WkF).	70+	60+	70—	70—	(3)	60—	Loblolly pine, Virginia pine, redcedar.
Group 7. Moderately deep to shallow, moderately well drained soils of the uplands; the surface layer is medium textured and is less than 6 inches thick; in places clayey material from the subsoil has been mixed into it; the subsoil is fine textured, very firm, and very plastic (IrB2, IrC2).	60—	50	(3)	50+	(3)	50+	Loblolly pine, Virginia pine, eastern redcedar.
Group 8. Deep, excessively drained loamy sand on first bottoms (Bn).	70+	60	(3)	(3)	(3)	(3)	Loblolly pine, shortleaf pine.
Group 9. Miscellaneous land types (MoC, MoD, Sg).	50–70	40–60	(3)	40–60	(3)	50–60	Virginia pine, loblolly pine, eastern redcedar.

[1] Deep soils are generally more than 30 inches deep; moderately deep soils are 20 to 30 inches deep; shallow soils are 10 to 20 inches deep; and very shallow soils are less than 10 inches deep. Moderately coarse textured soils are sandy loams and fine sandy loams; medium-textured soils are very fine sandy loams, loams, and silt loams; moderately fine textured soils are clay loams and sandy clay loams; fine-textured soils are clays, sandy clays, and silty clays.

[2] Site index is the total height of the dominant trees at 50 years of age; it indicates potential productivity. The site class given is based on preliminary studies, and that shown for a given species may be subject to adjustment as additional data are obtained.

[3] Ordinarily the species does not grow on these soils, or it is not suited to the soils.

The text first defines the limitations to the growing of trees and the ratings that are given for each limitation. Then, under each suitability group, it lists the soils in the group and explains the problems of management that apply to the soils of that particular group when used as woodland.

Discussed for each group are the hazards of seedling mortality, or the loss of seedlings as influenced by the kinds of soils. The seedlings referred to are established by natural reforestation, by direct seeding, or by planting. The ratings are slight—ordinarily, adequate natural regeneration will take place; moderate—natural regeneration cannot always be relied upon for adequate and immediate restocking; and severe—much replanting, special preparation of the seedbed, and superior planting techniques are needed to assure adequate restocking.

The expected hazard from competition from other plants refers to the degree of competition that can be expected from undesirable trees, shrubs, vines, and other plants that invade the site when openings are made in the canopy in a stand of desirable trees. A rating of slight means that competition from other plants is no special problem; of moderate, that plant competition develops but generally does not prevent an adequate stand from becoming established; and of severe, that plant competition prevents trees from restocking naturally.

Limitations to the use of equipment, or the relative trafficability, is discussed for each group. It refers to the characteristics of the soils, to the drainage, and to the slope and other topographic features that restrict or prohibit the use of equipment ordinarily used in tending the trees and in harvesting them. A rating of slight means that there is no restriction in the kind of equipment or in the time of year it is used; by moderate is meant that there is a seasonal restriction of less than 3 months in using the equipment and that the equipment can be expected to damage the roots of trees to some extent; and by severe is meant that there is a seasonal restriction of more than 3 months in the use of equipment and that the equipment can be expected to cause severe damage to the roots of the trees.

For each suitability group, the hazard of windthrow is indicated. Windthrow refers largely to windfirmness as reflected by the characteristics of the soils that control the development of the root system of trees. Since the development of the root system of trees differs among species or groups of species, however, the characteristics of the soils are not the only factor in determining windfirmness. Windfirmness is an important factor in controlling the density of a stand of trees. It is important in planning release cuttings, the thinning of the trees, and the intermediate and final harvest cuttings. Where a rating of slight is given for the hazard of windthrow, no special problem is recognized. If the rating is moderate, root development of designated species is adequate for stability, except for periods of excessive wetness and during periods of greatest wind velocity. A rating of severe indicates that the depth of tree rooting does not give adequate stability.

The hazards from forest diseases are also discussed for each group where a relationship exists between the kind of soil and possible losses from the diseases.

The hazard of erosion refers to the potential hazard of erosion when the soils are managed according to currently accepted standards. The ratings are based on the increasing risk of erosion.

Except for the site index ratings, the information given in table 3 and in the discussion for each woodland group was based largely upon the experience and judgment of local soil scientists, woodland conservationists, and landowners. Some of the information is based on the results of research. For example, the information about the relationship between the soils and disease and the hazard of flooding for certain species of trees is based on the results of research. The information in this section represents the best knowledge now available about the way soils influence the growth and management of trees.

WOODLAND SUITABILITY GROUP 1

The soils of this group are deep and friable and are well drained to somewhat poorly drained. Some are on large flood plains, and others are on smaller areas of colluvium and local alluvium of the uplands. The following soils are in this group:

Cw	Chewacla soils.
Cy	Congaree soils.
Lo	Local alluvial land.
Mm	Mixed alluvial land.
St	Starr loam.

These soils are medium to low in organic matter and have rapid to moderate permeability. Except for Local alluvial land, all of the soils have high water-supplying capacity and other characteristics that favor the growth of trees.

The Congaree and Chewacla soils and Mixed alluvial land are on first bottoms. They are subject to flooding, but they are seldom under water for long periods. For these soils, the hazard of overflow is the chief limitation to growing trees.

The Starr soil and Local alluvial land are well drained or moderately well drained. They are in depressions and in other low areas in the uplands, and they are not subject to flooding. These two soils are underlain by colluvium and local alluvium that washed or rolled from soils of higher areas of the uplands.

Seedling mortality is generally not a problem on soils of this group. Yellow-poplar, however, should not be planted in areas where the floodwaters remain for 3 days or longer in summer (*5*). In places the soils need a system of surface drains that will eliminate the hazard of flooding.

In places competition from low-grade hardwoods, from shrubs, and from honeysuckle and other vines prevents the natural restocking of desirable trees on the soils of this group, but it generally does not prevent an adequate stand of trees from becoming established. Intensive weeding or other preparation of the site is required, in places, if pine and other desirable trees are to regenerate.

Most areas of these soils are not readily accessible during wet periods. In many places the areas are too wet in winter for logging equipment to be used. The equipment is likely to cause damage to the roots of the trees and to the structure of the soils.

The hazard of erosion is slight on these soils. Except during periods when the wind is unusually high, windthrow is not a hazard.

WOODLAND SUITABILITY GROUP 2

The soils of this group are deep and are poorly drained or somewhat poorly drained. They are on first bottoms or low terraces. The water table is high in these areas, and the soils are subject to seepage or overflow. The following soils are in this group:

- Mn Mixed alluvial land, wet.
- Wa Warne and Roanoke fine sandy loams.
- We Wehadkee silt loam.
- Wo Worsham loam.

Except for Mixed alluvial land, wet, which varies in permeability, these soils have moderately slow to slow permeability.

The Wehadkee soil and Mixed alluvial land, wet, are on first bottoms where they are subject to frequent flooding. Water remains on or near the surface for long periods unless adequate surface drainage is provided.

The Warne and Roanoke soils are on low terraces along rivers or other streams. They have somewhat poor to poor internal drainage and medium to slow runoff. Permeability is slow. Pines and hardwoods that tolerate wetness grow well on these soils.

The Worsham soil is generally in depressions and in draws in the uplands. The areas receive seepage water from soils of higher areas, but this soil is not subject to flooding. Trees that grow on this soil are likely to be injured by drought.

Unless drainage is controlled, seedling mortality is likely to be severe on the Wehadkee soil and on Mixed alluvial land, wet. Pines and yellow-poplar are particularly susceptible to damage from excessive moisture, and in places surface drainage is required before a stand of these trees can be established. Seedling mortality is slight to moderate on the Worsham, Warne, and Roanoke soils.

In places competition from undesirable plants is severe on the soils of this group. In such areas intensive weeding or other preparation of the site is required if desirable kinds of trees are to regenerate naturally.

These soils are not readily accessible during wet periods. If equipment is used when the areas are wet, there likely will be severe damage to the roots of trees and to the structure of the soils. Unless adequate drainage is provided, the areas are generally too wet in winter for use of logging equipment.

The hazard of erosion is slight on these soils. Except when winds are unusually high, windthrow is not a hazard.

WOODLAND SUITABILITY GROUP 3

This group consists of deep, well-drained to somewhat poorly drained soils on low terraces or low uplands. In these soils the content of organic matter is medium to low. The soils have been placed in two subgroups according to degree of erosion:

3A. Uneroded to slightly eroded—
- AfB Altavista fine sandy loam, 2 to 6 percent slopes.
- CxB Colfax sandy loam, 2 to 6 percent slopes.

3B. Moderately eroded—
- AfB2 Altavista fine sandy loam, 2 to 6 percent slopes, eroded.

The Altavista soils, which are on terraces along large streams, are nearly level to gently sloping and are well drained or moderately well drained. They have moderately slow permeability and moderate moisture-supplying capacity.

The Colfax soil is somewhat poorly drained. It is generally in depressions at the heads of small drainageways and on low divides between drainageways in the gently sloping uplands. This soil has moderate permeability and moderate moisture-supplying capacity.

The productivity of the soils in woodland group 3 ranges from average to very good for loblolly, shortleaf, and Virginia pines. The site index for loblolly and shortleaf pines is lower on the moderately eroded Altavista soil than on the other soils in the group.

Seedling mortality is generally slight to moderate on soils of this group, and the loss of seedlings increases according to the degree of erosion. It is generally necessary to plant seedlings by hand in the more eroded areas.

Competition from undesirable plants is slight to moderate. As a rule, it decreases with the increase in erosion. Nevertheless, weeding of the site or other preparation is needed in places to establish desirable trees.

During wet periods, it is difficult to gain access to the soils. In winter, logging is restricted in some places.

The hazard of erosion is slight to moderate. Except for Virginia pine, the hazard of windthrow is fairly slight. Virginia pine has a shallow root system and is, therefore, more susceptible to windthrow than most southern pines. Thinning or partial cutting of the trees in the older stands of Virginia pine is not advisable (*8*).

WOODLAND SUITABILITY GROUP 4

The soils of this group are well drained and are deep or moderately deep. They are on uplands and on terraces. Their subsoil is easily penetrated by the roots of trees, and they have moderate permeability and moisture-supplying capacity. These soils have been placed in three subgroups according to the degree of erosion:

4A. Uneroded or slightly eroded—
- AsB Appling sandy loam, 2 to 6 percent slopes.
- AsC Appling sandy loam, 6 to 10 percent slopes.
- AsD Appling sandy loam, 10 to 15 percent slopes.
- AsE Appling sandy loam, 15 to 25 percent slopes.
- CfB Cecil fine sandy loam, 2 to 6 percent slopes.
- CfC Cecil fine sandy loam, 6 to 10 percent slopes.
- CfD Cecil fine sandy loam, 10 to 15 percent slopes.
- CgB Cecil gravelly fine sandy loam, 2 to 6 percent slopes.
- CgC Cecil gravelly fine sandy loam, 6 to 10 percent slopes.
- CgD Cecil gravelly fine sandy loam, 10 to 15 percent slopes.
- CgE Cecil gravelly fine sandy loam, 15 to 25 percent slopes.
- CmB Cecil sandy loam, 2 to 6 percent slopes.
- CmC Cecil sandy loam, 6 to 10 percent slopes.
- CmD Cecil sandy loam, 10 to 15 percent slopes.
- CsE Cecil soils, 15 to 25 percent slopes.
- CsF Cecil soils, 25 to 45 percent slopes.
- CuE Cecil stony fine sandy loam, shallow, 15 to 25 percent slopes.
- CuF Cecil stony fine sandy loam, shallow, 25 to 55 percent slopes.
- LfB Lloyd fine sandy loam, 2 to 6 percent slopes.
- LfC Lloyd fine sandy loam, 6 to 10 percent slopes.
- LfD Lloyd fine sandy loam, 10 to 15 percent slopes.
- LfE Lloyd fine sandy loam, 15 to 25 percent slopes.
- LmB Lloyd loam, 2 to 6 percent slopes.
- LmC Lloyd loam, 6 to 10 percent slopes.
- LmD Lloyd loam, 10 to 15 percent slopes.
- LmE Lloyd loam, 15 to 25 percent slopes.
- MdB Madison gravelly fine sandy loam, 2 to 6 percent slopes.

MdC Madison gravelly fine sandy loam, 6 to 10 percent slopes.
MdD Madison gravelly fine sandy loam, 10 to 15 percent slopes.
MdE Madison gravelly fine sandy loam, 15 to 25 percent slopes.
MdF Madison gravelly fine sandy loam, 25 to 45 percent slopes.
WfB Wickham fine sandy loam, 2 to 6 percent slopes.

4B. Moderately eroded—
AsB2 Appling sandy loam, 2 to 6 percent slopes, eroded.
AsC2 Appling sandy loam, 6 to 10 percent slopes, eroded.
AsD2 Appling sandy loam, 10 to 15 percent slopes, eroded.
AsE2 Appling sandy loam, 15 to 25 percent slopes, eroded.
CfB2 Cecil fine sandy loam, 2 to 6 percent slopes, eroded.
CfC2 Cecil fine sandy loam, 6 to 10 percent slopes, eroded.
CfD2 Cecil fine sandy loam, 10 to 15 percent slopes, eroded.
CgB2 Cecil gravelly fine sandy loam, 2 to 6 percent slopes, eroded.
CgC2 Cecil gravelly fine sandy loam, 6 to 10 percent slopes, eroded.
CgD2 Cecil gravelly fine sandy loam, 10 to 15 percent slopes, eroded.
CgE2 Cecil gravelly fine sandy loam, 15 to 25 percent slopes, eroded.
CmB2 Cecil sandy loam, 2 to 6 percent slopes, eroded.
CmC2 Cecil sandy loam, 6 to 10 percent slopes, eroded.
CmD2 Cecil sandy loam, 10 to 15 percent slopes, eroded.
CsE2 Cecil soils, 15 to 25 percent slopes, eroded.
CsF2 Cecil soils, 25 to 45 percent slopes, eroded.
CtD2 Cecil stony fine sandy loam, 6 to 15 percent slopes, eroded.
DaB2 Davidson clay loam, 2 to 6 percent slopes, eroded.
DaC2 Davidson clay loam, 6 to 10 percent slopes, eroded.
HwB2 Hiwassee loam, 2 to 6 percent slopes, eroded.
HwC2 Hiwassee loam, 6 to 10 percent slopes, eroded.
LfB2 Lloyd fine sandy loam, 2 to 6 percent slopes, eroded.
LfC2 Lloyd fine sandy loam, 6 to 10 percent slopes, eroded.
LfD2 Lloyd fine sandy loam, 10 to 15 percent slopes, eroded.
LfE2 Lloyd fine sandy loam, 15 to 25 percent slopes, eroded.
LmB2 Lloyd loam, 2 to 6 percent slopes, eroded.
LmC2 Lloyd loam, 6 to 10 percent slopes, eroded.
LmD2 Lloyd loam, 10 to 15 percent slopes, eroded.
LmE2 Lloyd loam, 15 to 25 percent slopes, eroded.
MdB2 Madison gravelly fine sandy loam, 2 to 6 percent slopes, eroded.
MdC2 Madison gravelly fine sandy loam, 6 to 10 percent slopes, eroded.
MdD2 Madison gravelly fine sandy loam, 10 to 15 percent slopes, eroded.
MdE2 Madison gravelly fine sandy loam, 15 to 25 percent slopes, eroded.
MfB2 Mayodan sandy loam, 2 to 6 percent slopes, eroded.
WfB2 Wickham fine sandy loam, 2 to 6 percent slopes, eroded.
WfC2 Wickham fine sandy loam, 6 to 10 percent slopes, eroded.

4C. Severely eroded—
AmC3 Appling sandy clay loam, 6 to 10 percent slopes, severely eroded.
AmD3 Appling sandy clay loam, 10 to 15 percent slopes, severely eroded.
CcB3 Cecil clay loam, 2 to 6 percent slopes, severely eroded.
CcC3 Cecil clay loam, 6 to 10 percent slopes, severely eroded.
CcD3 Cecil clay loam, 10 to 15 percent slopes, severely eroded.
CcE3 Cecil clay loam, 15 to 25 percent slopes, severely eroded.
LcB3 Lloyd clay loam, 2 to 6 percent slopes, severely eroded.
LcC3 Lloyd clay loam, 6 to 10 percent slopes, severely eroded.
LcD3 Lloyd clay loam, 10 to 15 percent slopes, severely eroded.
LcE3 Lloyd clay loam, 15 to 25 percent slopes, severely eroded.

The soils of the Appling, Cecil, Davidson, Lloyd, Madison, and Mayodan series formed on uplands in materials weathered from the underlying rocks. Their surface layer is sandy loam to clay loam and is gravelly or stony in many places. Their subsoil is friable or firm clay loam and clay. The soils of the Hiwassee and Wickham series formed on stream terraces in old alluvium. Their surface layer is loam or fine sandy loam, and their subsoil is friable or firm clay or clay loam. The potential productivity of all the soils in this group decreases with the increase in erosion.

Seedling mortality ranges from slight on the uneroded soils of this group to severe on the severely eroded soils. It is generally necessary to plant seedlings by hand on the more eroded soils, and extensive replanting may be necessary on the severely eroded ones.

Competition from other plants is moderate on the uneroded or slightly eroded soils and is slight to none on the eroded soils. In some places weeding or other preparation of the site is needed before desirable kinds of trees can be established on the uneroded and moderately eroded soils.

In places steep slopes and severe erosion limit access to the soils and restrict logging. If the slopes are not protected, roads that cross the soils and that have an appreciable grade are likely to be severely eroded.

Except for Virginia pine, the hazard of windthrow ranges from slight on the uneroded soils to moderate on the severely eroded ones.

Trees on the eroded soils are more susceptible to littleleaf disease, in areas where littleleaf disease is prevalent, than those on uneroded soils. It is best to plant loblolly pine on areas of these soils that are reforested.

WOODLAND SUITABILITY GROUP 5

This group is made up of moderately deep, well-drained soils of uplands. The soils developed in materials weathered from basic rock. Their surface layer is loam and clay loam, and their subsoil is firm clay that is compact and plastic. The soils have been placed in two subgroups, according to degree of erosion:

5A. Moderately eroded—
MkB2 Mecklenburg loam, 2 to 6 percent slopes, eroded.
MkC2 Mecklenburg loam, 6 to 10 percent slopes, eroded.
MkD2 Mecklenburg loam, 10 to 15 percent slopes, eroded.

5B. Severely eroded—
MhD3 Mecklenburg clay loam, 6 to 15 percent slopes, severely eroded.

The penetration and distribution of roots are slightly impeded in the soils of this group. The soils have moderately slow permeability and are moderate to low in moisture-supplying capacity.

Seedling mortality is severe on the severely eroded soil of this group, and slight on the other soils. Ordinarily, it is necessary to plant seedlings by hand on these soils. In places extensive replanting will be needed on the severely eroded soil.

Competition from other plants is slight to none on the severely eroded soil and moderate on the other soils. In some places weeding of the site is necessary before desirable kinds of trees can be established.

Steep slopes and severe erosion limit access to the soils and restrict logging. In areas of these soils that have an appreciable grade, roads on unprotected slopes are likely to be severely eroded.

The hazard of windthrow for all the species, except Virginia pine, is moderate on the severely eroded soil and slight on the other soils.

Because of the slow to medium internal drainage in these eroded soils, littleleaf disease of shortleaf pine is severe. If littleleaf disease is prevalent, it is best to plant loblolly pine in the areas that are to be reforested.

WOODLAND SUITABILITY GROUP 6

The soils of this group are on the uplands, and they are well drained and shallow over weathered rock. Their surface layer is loam to sandy loam and overlies weathered rock. Depth to bedrock is variable. The following soils are in this group:

LuC	Louisburg and Louisa soils, 6 to 10 percent slopes.
LuD	Louisburg and Louisa soils, 10 to 15 percent slopes.
LuE	Louisburg and Louisa soils, 15 to 25 percent slopes.
LuF	Louisburg and Louisa soils, 25 to 55 percent slopes.
WkC	Wilkes soils, 6 to 10 percent slopes.
WkD	Wilkes soils, 10 to 15 percent slopes.
WkE	Wilkes soils, 15 to 25 percent slopes.
WkF	Wilkes soils, 25 to 55 percent slopes.

Because these soils have a shallow, weakly developed B horizon, they are droughty during dry periods. As a result, seedling mortality is moderate to severe, and extensive replanting of seedlings is needed in places.

Competition from other plants is slight to moderate. In places weeding of the site is required before desirable kinds of trees can be established.

Steep slopes limit access to these soils, and in places they restrict the use of logging equipment and other equipment used in harvesting and tending the trees. If the slopes are not protected, the hazard of erosion is severe. On all of these soils, the hazard of windthrow is severe.

In areas where littleleaf disease is prevalent, the hazard to shortleaf pine is likely to be severe.

WOODLAND SUITABILITY GROUP 7

The soils in this group are shallow to moderately deep over bedrock, and they are somewhat poorly drained to moderately well drained. They are on the uplands. Their surface layer is loam, and their subsoil is very firm, very plastic clay. The following soils are in this group:

IrB2	Iredell loam, 2 to 6 percent slopes, eroded.
IrC2	Iredell loam, 6 to 10 percent slopes, eroded.

These soils are slowly permeable and are low in moisture-supplying capacity. Their firm, plastic subsoil severely limits the development of tree roots and makes the soils difficult to manage for trees.

Seedling mortality is generally severe on these soils. In places extensive replanting is needed.

Competition from other plants is generally moderate, but in some places weeding of the site is required before pines can be established. The use of equipment is severely restricted during wet periods. If the slopes are not protected, the hazard of erosion is severe on these soils. Because of the shallow root zone, windthrow is common.

In areas where littleleaf disease is prevalent, the hazard to shortleaf pine is severe. It is best to plant loblolly or Virginia pines in the areas that are reforested.

The soils of this group are not suited to the growing of hardwoods for commercial purposes.

WOODLAND SUITABILITY GROUP 8

Only one soil—Buncombe loamy sand—is in this group. It is a deep, excessively drained soil that is on first bottoms where it is subject to flooding.

This soil is low in organic matter. It has rapid permeability and is low in moisture-supplying capacity.

Because this soil is droughty, seedling mortality is very severe. In places extensive replanting is required. Competition from other plants is generally not a problem.

Limitations to the use of equipment are generally moderate, chiefly because this sandy soil is deep. The hazard of erosion is not a problem. Once established, trees on this soil are generally not susceptible to windthrow.

WOODLAND SUITABILITY GROUP 9

This group consists of several miscellaneous land types. The areas are made up of soils in which the profile has been changed greatly by very severe erosion. The areas are moderately to severely gullied, and investigations at the site are required to determine how the areas can be managed for trees. The site indexes for these land types vary widely, and in many areas the site will require special preparation before a stand of desirable kinds of trees can be established and maintained. The following land types are in this group:

MoC	Moderately gullied land, rolling.
MoD	Moderately gullied land, hilly.
Sg	Severely gullied land.

Seedling mortality is very severe on these land types. The seedlings need to be planted by hand, and special preparation of the site is required to establish trees or other vegetation. In places extensive replanting of the seedlings is necessary. Generally there is no competition from other plants.

The use of most equipment is severely limited by gullies. The hazard of erosion is very severe, and the hazard of windthrow is also very severe for all kinds of trees.

In places many of the loblolly pines die out and littleleaf disease of shortleaf pine is likely to be very severe.

The land types in this group are not suited to the commercial production of trees for sawtimber.

Stand and yield information

In table 4 stand and yield information is given for well-stocked stands of unmanaged, normally growing loblolly

and shortleaf pines. The information provides a basis for relating research on timber volume by site index ratings and age of the species to the different kinds of soils shown on the map. The information is from published results of research (*10*) and shows how site index ratings can be converted readily to cords or to cubic foot or board foot measure.

Neither pine nor hardwood stands have been managed long enough to determine the amount of wood per acre that can be produced under good woodland management. The stand and yield information given in the table for loblolly and shortleaf pines, however, can be used as a guide to determine the productive potential of pines until data from managed stands become available.

TABLE 4.—*Stand and yield information per acre for well-stocked, unmanaged, normally growing loblolly and shortleaf pines*

[Statistics in this table are compiled from United States Department of Agriculture Miscellaneous Publication No. 50. (*10*)]

LOBLOLLY PINE

Site index	Age	Total merchantable volume				Total height of average dominant trees	Average diameter at breast height [4]	Basal area at breast height [4]	Trees [4]
	Years	*Cubic feet (unpeeled)*[1]	*Cords (rough wood)*[1]	*Board feet (Scribner)*[2]	*Board feet (International ¼ in.)*[3]	*Feet*	*Inches*	*Square feet*	*Number*
60	20	1, 500	12			32	3. 6	121	1, 600
	30	2, 750	25	1, 250	4, 500	45	5. 4	138	850
	40	3, 700	35	4, 500	10, 000	54	6. 8	147	585
	50	4, 300	41	8, 550	15, 000	60	7. 9	152	440
	60	4, 700	46	12, 250	19, 000	64	8. 9	156	360
	70	5, 000	49	15, 250	22, 000	67	9. 7	158	310
	80	5, 200	51	17, 550	24, 000	69	10. 4	160	275
70	20	1, 900	17	100	1, 500	38	4. 3	125	1, 185
	30	3, 350	31	3, 500	8, 500	52	6. 5	143	640
	40	4, 500	42	9, 400	16, 000	63	8. 1	151	435
	50	5, 200	50	15, 200	22, 000	70	9. 4	157	325
	60	5, 700	55	19, 600	26, 500	75	10. 6	160	270
	70	6, 000	59	22, 550	29, 500	78	11. 5	163	230
	80	6, 200	62	24, 600	32, 000	80	12. 3	165	205
80	20	2, 350	22	700	3, 000	43	5. 0	129	950
	30	4, 000	38	6, 500	12, 500	59	7. 4	147	510
	40	5, 300	51	14, 800	22, 000	72	9. 2	156	345
	50	6, 150	60	21, 700	29, 500	80	10. 7	162	255
	60	6, 650	66	26, 400	34, 500	85	12. 0	165	210
	70	7, 000	70	29, 500	38, 000	89	13. 1	168	185
	80	7, 300	73	31, 550	40, 500	92	14. 0	170	160
90	20	2, 850	27	1, 600	5, 000	48	5. 6	133	790
	30	4, 700	46	10, 700	17, 000	67	8. 2	152	420
	40	6, 200	61	20, 550	28, 500	81	10. 2	162	290
	50	7, 200	71	28, 250	37, 500	90	12. 0	167	220
	60	7, 800	78	33, 100	43, 000	96	13. 4	171	180
	70	8, 200	82	36, 600	47, 000	100	14. 6	174	150
	80	8, 550	85	39, 100	50, 000	103	15. 6	176	135
100	20	3, 300	32	2, 750	7, 500	54	6. 1	138	690
	30	5, 400	53	14, 800	22, 000	74	9. 0	158	375
	40	7, 150	71	26, 700	35, 500	90	11. 2	168	255
	50	8, 400	84	35, 050	45, 500	100	13. 1	174	190
	60	9, 150	92	41, 000	52, 500	107	14. 6	178	155
	70	9, 600	96	44, 750	57, 000	112	15. 9	181	135
	80	9, 950	100	47, 400	60, 500	115	17. 1	182	115
110	20	3, 850	37	4, 300	10, 000	59	6. 6	145	615
	30	6, 200	62	19, 200	27, 500	81	9. 7	166	335
	40	8, 200	82	32, 800	43, 000	99	12. 1	176	225
	50	9, 650	96	42, 500	54, 500	110	14. 1	182	170
	60	10, 550	106	49, 200	63, 000	118	15. 9	186	140
	70	11, 150	112	53, 100	68, 000	122	17. 3	189	120
	80	11, 500	116	55, 900	71, 500	126	18. 4	191	105

See footnotes at end of table.

TABLE 4.—*Stand and yield information per acre for well-stocked, unmanaged, normally growing loblolly and shortleaf pines*—Continued

SHORTLEAF PINE

Site index	Age	Total merchantable volume				Total height of average dominant trees	Average diameter at breast height [4]	Basal area at breast height [4]	Trees [4]
		Cubic feet (unpeeled) [1]	*Cords (rough wood)* [1]	*Board feet (Scribner)* [2]	*Board feet (International ¼ in.)* [3]				
	Years					*Feet*	*Inches*	*Square feet*	*Number*
40	20					20	2.0	132	6,000
	30	1,160	13			28	3.2	151	2,565
	40	2,130	24	350	1,750	35	4.3	154	1,525
	50	2,730	30	1,250	4,300	40	5.1	154	1,055
	60	3,120	34	2,700	6,900	44	5.8	154	820
	70	3,380	37	4,450	9,600	47	6.3	154	680
	80	3,570	38	6,500	12,000	50	6.9	154	580
50	20					25	2.5	139	3,425
	30	2,040	23	50	900	35	3.9	158	1,855
	40	2,980	33	1,450	5,000	44	5.1	162	1,085
	50	3,970	43	4,400	9,900	50	6.1	162	760
	60	4,430	48	8,150	14,900	55	6.9	162	590
	70	4,780	51	11,600	19,000	59	7.6	162	485
	80	5,050	53	14,400	22,000	62	8.3	162	420
60	20	1,060	12			30	2.9	142	2,520
	30	2,880	32	750	3,300	42	4.6	162	1,370
	40	4,200	46	4,400	10,300	52	6.0	166	815
	50	5,080	54	10,600	18,300	60	7.2	166	570
	60	5,690	60	15,850	24,500	66	8.2	166	445
	70	6,170	65	19,700	28,700	71	9.0	166	370
	80	6,520	68	22,600	32,000	74	9.8	166	315
70	20	1,600	18		250	34	3.5	145	1,965
	30	3,720	41	2,400	6,900	49	5.4	165	1,060
	40	5,210	56	9,900	17,800	61	7.0	169	625
	50	6,250	66	17,850	27,200	70	8.3	169	440
	60	7,000	73	23,450	33,500	77	9.4	169	345
	70	7,580	79	27,550	38,200	82	10.4	169	285
	80	8,020	83	30,700	42,000	86	11.2	169	240
80	20	2,190	25	200	1,600	39	4.1	147	1,495
	30	4,420	48	5,200	11,800	56	6.2	167	815
	40	6,100	65	16,200	25,500	70	8.0	171	485
	50	7,380	77	24,900	35,600	80	9.5	171	335
	60	8,250	85	30,900	42,600	88	10.8	171	260
	70	8,920	92	35,200	47,900	94	11.9	171	215
	80	9,460	97	38,550	52,000	99	12.9	171	185
90	20	2,660	30	1,100	3,800	44	5.0	148	1,080
	30	5,050	54	11,200	18,900	63	7.3	169	590
	40	7,000	73	23,400	33,400	78	9.4	173	345
	50	8,450	87	32,400	44,250	90	11.2	173	245
	60	9,500	98	38,700	52,250	99	12.8	173	185
	70	10,280	105	43,000	58,100	106	14.1	173	160
	80	10,910	112	46,500	62,800	111	15.3	173	140

[1] Stand 4 inches in diameter breast high and more.
[2] Stand 8 inches in diameter breast high and more.
[3] Stand 7 inches in diameter breast high and more.
[4] Stand 2 inches in diameter breast high and more.

Engineering Uses of the Soils [6]

This soil survey report for Iredell County, N.C., contains information that can be used by engineers to—

1. Make soil and land use studies that will aid in selecting and developing industrial, business, residential, and recreational sites.
2. Assist in planning for drainage and irrigation systems, farm ponds, diversion terraces, and other structures for soil and water conservation.
3. Make preliminary evaluations of soil and ground conditions that will aid in selecting locations for highways and airports and in planning detailed surveys of the soils at the selected locations.
4. Locate sand, gravel, and rock for use in construction.
5. Correlate the performance of engineering structures with the soil mapping units and thus develop information that will be useful in designing and maintaining the structures.
6. Determine the suitability of the soil mapping units for cross-country movements of vehicles and construction equipment.
7. Supplement information obtained from other published maps, reports, and aerial photographs for the purpose of making maps and reports that can be used readily by engineers.
8. Develop preliminary estimates of a particular site to determine its suitability for construction purposes.

The mapping and the descriptive report are somewhat generalized and should be used only in planning more detailed field surveys to determine the in-place condition of the soil at the site of the proposed engineering construction.

The engineer can obtain some information useful for engineering from the soils map, but it will also be necessary for him to refer to other parts of the report. By using the information in the soils map, the profile descriptions, and the tables in this section, the soils engineer can plan a detailed survey of the soil at the site of construction. Then, after he has tested the soils and observed their behavior in structures and foundations, he can estimate design requirements for the different soils shown on the map.

Some of the terms used by the soil scientist may be unfamiliar to the engineer, and some words—for example, soil, clay, silt, and sand—may have special meanings in soil science. These and other special terms that are used are defined in the Glossary at the end of the report.

Engineering classification systems

Most highway engineers classify soil material in accordance with the system approved by the American Association of State Highway Officials (*1*). In this system soil materials are classified in seven principal groups. The groups range from A-1, which consists of gravelly soils of high bearing capacity, to A-7, which consists of clayey soils that have low strength when wet. Within each group the relative engineering value of the soil material is indicated by a group index number. Group index numbers range from 0 for the best material to 20 for the poorest. The group index number is shown in parentheses following the soil group symbol in table 7.

Some engineers prefer to use the Unified soil classification system (*14*). In this system soil materials are classified into 15 groups, 8 of which are classed as fine grained, 6 as coarse grained, and 1 as highly organic. The last column of table 7 also gives the classification of the tested soils of Iredell County according to the Unified system.

The classification of a soil material by either the AASHO or the Unified system identifies that soil material with regard to gradation and plasticity characteristics. The classification permits the engineer to make a rapid appraisal of the soil material by comparing it with more familiar soils that have the same classification.

Engineering descriptions of soils

In table 5 brief descriptions of the soils of Iredell County and their estimated physical properties are given. The estimates are only for the typical soils, and variations from these values should be expected. The information in the table is based on the results of test data shown in table 7 and on characteristics observed in the field. Data from tests made of similar soils in other counties were also used.

The descriptions of the soil profiles in table 5 apply only to the uneroded and moderately eroded soils in each series. In severely eroded soils, the second layer of the described profile is normally the surface layer.

In table 5 depth to the seasonally high water table is shown as 10+ when the depth is more than 10 feet, because a depth greater than 10 feet cannot be estimated.

For most of the soils, the depth to bedrock varies considerably. This is because the resistance of the bedrock to weathering varies from place to place. Also, some slopes are younger geologically or geomorphologically than others. On these relatively young slopes, the hard rock is closer to the surface than on older slopes that are underlain by similar rocks. The range given in the column showing depth to bedrock is that typical of most areas, but in many places soft, weathered rock extends to a greater depth than that given.

Also given in table 5 is the estimated classification of the soils according to the AASHO and the Unified systems. The estimated percentages of material passing through sieves of various sizes are given in table 5.

The permeability was estimated for the subsoil in place. That is, an estimate was made of the probable rate of water percolation through material that was not compacted.

[6] B. F. INGRAM, civil engineer, Soil Conservation Service, assisted with this section.

The estimates were based on observed characteristics and were compared with permeability tests made on undisturbed cores of similar material.

The column that shows the available water capacity gives the approximate amount of water held in a soil when the soil is wet to field capacity. The estimates given are for average conditions of texture and structure for each layer of soil.

The shrink-swell potential is the volume change that occurs in soil material when its content of moisture changes. In general, soils classed as CH and A-7 have "High" shrink-swell potential, although in some soils, such as Iredell, the subsoil may be rated "Very high." Clean sands and gravels (single-grain structure), and those having small amounts of nonplastic to slightly plastic clays have "Low" shrink-swell potential.

Engineering interpretations

In table 6 the most suitable locations for the highway gradeline are given for the soils of the county. Also given are ratings for the suitability of the soils as a source of topsoil, borrow material for homogeneous earth dams and shells, and of material for cores of earth dams. In addition, the suitability of the soils for farm ponds and terraces, and as fields for septic tanks is shown, and the need of the soils for agricultural drainage is indicated. The ratings are based on estimated data in table 5, on actual test data, and on observations made in the field.

In many soils of the county, the highway gradeline can be located in any position on or in the soil. In some soils, however, a high water table, bedrock, or very plastic clay must be considered before the best position of the gradeline is determined.

Cuts made in constructing highways need protection from erosion in most soils of the county. Establishing a cover of vegetation on slopes of all cuts and fills of new roads will help provide protection, although the amount of cover needed varies from place to place.

The suitability of the soils for homogeneous dams and for shells of dams, where the soil material is the same throughout the dam, is rated according to the shear strength, cohesion, settling potential, workability, resistance to erosion, and imperviousness of the material when placed and compacted by normal construction equipment. For soils that contain thin layers of material that differs greatly in texture, it is assumed that the soil material in the layers will be mixed during normal construction operations. It is assumed that the unsuitable material in soils that contain small amounts of rock, organic matter, and other nonsoil material is not used in the dam.

For an earth dam, the material used as a core is rated for suitability according to the imperviousness of the soil when it is properly placed and compacted.

Generally, large amounts of soil material are moved in the construction of farm ponds, terraces, and other structures used to conserve soil and water. The soils of Iredell County are suited to the use of normal construction practices, but in most of the soils there are obstacles that affect the choice of site, the design, and the installing of structures to conserve soil and water.

In table 6 the suitability of the soils for farm pond reservoirs is rated according to the natural ability of the soil to store water without excessive seepage. It is assumed that the water is impounded by a dam that has an adequate cutoff core.

The suitability of a soil as a foundation for a dam is rated according to the ability of the soil, in the natural state, to support the dam without excessive consolidation of the foundation material. It is also rated according to the difficulty in preventing excessive seepage through the foundation material. It is assumed that, in normal construction operations, all organic material and other undesirable material are stripped from the surface layer of the foundation and that a nominal keyway is provided.

Soils are rated as suitable for terraces if farm equipment or light construction equipment can be used on them to construct the terraces. They are rated unsuitable if the soil is too shallow, rocky, or plastic for normal construction methods to be used. Terraces are not needed on soils that are nearly level.

Also in table 6 the need for agricultural drainage is indicated as related to the soil in its natural state and to the use that is to be made of the soil. The response to agricultural drainage is related to the ease with which adequate drainage can be accomplished.

The suitability of a soil as a field for septic tanks is rated according to the depth and natural drainage of the soil and the permeability of the soil material. The rating is useful for those who are selecting a homesite or who are investigating the suitability of an area for development of real estate.

Also important in highway engineering is information about the need of reinforcing the subgrade if a flexible pavement is to be laid. In Iredell County a porous subbase is used for all rigid pavements. For flexible pavement, some soils, principally the Buncombe, Cecil, and Lloyd soils, Moderately gullied land, and Severely gullied land, need a reinforced subbase.

A subbase is needed as a foundation course for flexible pavements constructed on most of the soils in the county. A porous base course is also needed for all rigid pavements.

There are no large commercial sources of sand and gravel in the county. Gravel can be obtained in the form of crushed stone from various quarries. Sand is available from several places along the Catawba River.

TABLE 5.—*Brief description of the soils of Iredell*

Map symbol	Soil	Depth to seasonally high water table	Depth to bedrock	Permeability of subsoil	Reaction	Brief description of site and soil
		Feet	*Feet*		*pH*	
AfB	Altavista fine sandy loam, 2 to 6 percent slopes.	3–8	8–30	Moderate	5. 1–5. 5	Moderately well drained soils of stream terraces; they consist of 6 to 18 inches of fine sandy loam over 20 to 50 inches of clay; underlain by 8 to 30 feet of unconsolidated, stratified alluvium.
AfB2	Altavista fine sandy loam, 2 to 6 percent slopes eroded.					
AmC3	Appling sandy clay loam, 6 to 10 percent slopes severely eroded.	10+	5–15	Moderate	5. 1–5. 5	Well-drained soils on ridges and slopes in the uplands; they consist of 3 to 12 inches of sandy loam or sandy clay loam over 24 to 48 inches of clay; underlain by 5 to 15 feet of weathered granite or granite gneiss.
AmD3	Appling sandy clay loam, 10 to 15 percent slopes, severely eroded.					
AsB	Appling sandy loam, 2 to 6 percent slopes.					
AsB2	Appling sandy loam, 2 to 6 percent slopes, eroded.					
AsC	Appling sandy loam, 6 to 10 percent slopes.					
AsC2	Appling sandy loam, 6 to 10 percent slopes, eroded					
AsD	Appling sandy loam, 10 to 15 percent slopes.					
AsD2	Appling sandy loam, 10 to 15 percent slopes, eroded.					
AsE	Appling sandy loam, 15 to 25 percent slopes.					
AsE2	Appling sandy loam, 15 to 25 percent slopes, eroded.					
Bn	Buncombe loamy sand.	6–10	6–20	Rapid	5. 6–6. 0	Excessively drained soil on flood plains of streams; it consists of 36 to 60 inches of loamy sand over stratified alluvium; subject to occasional overflow.
CcB3	Cecil clay loam, 2 to 6 percent slopes, severely eroded.	10 +	6 -15	Moderate	5. 1–5. 5	Well-drained soils on ridges and slopes in the uplands; they consist of 3 to 15 inches of sandy loam, fine sandy loam, or clay loam over 18 to 60 inches of clay; underlain by weathered granite, gneiss, or schist.
CcC3	Cecil clay loam, 6 to 10 percent slopes, severely eroded.					
CcD3	Cecil clay loam, 10 to 15 percent slopes, severely eroded.					
CcE3	Cecil clay loam, 15 to 25 percent slopes, severely eroded.					
CfB	Cecil fine sandy loam, 2 to 6 percent slopes.					
CfB2	Cecil fine sandy loam, 2 to 6 percent slopes, eroded.					
CfC	Cecil fine sandy loam, 6 to 10 percent slopes.					
CfC2	Cecil fine sandy loam, 6 to 10 percent slopes, eroded.					
CfD	Cecil fine sandy loam, 10 to 15 percent slopes.					
CfD2	Cecil fine sandy loam, 10 to 15 percent slopes, eroded.					
CmB	Cecil sandy loam, 2 to 6 percent slopes.					
CmB2	Cecil sandy loam, 2 to 6 percent slopes, eroded.					
CmC	Cecil sandy loam, 6 to 10 percent slopes.					
CmC2	Cecil sandy loam, 6 to 10 percent slopes, eroded.					
CmD	Cecil sandy loam, 10 to 15 percent slopes.					
CmD2	Cecil sandy loam, 10 to 15 percent slopes, eroded.					

County, N.C., and their estimated physical properties [1]

Depth from surface (typical profile)	Classification		Percentage passing—			Selected characteristics significant in engineering—	
	Unified	AASHO	No. 4 sieve	No. 10 sieve	No. 200 sieve	Available water capacity	Shrink-swell potential
Inches						*Inches per inch*	
0–14	SM	A–2–4	100	100	35	0. 11	Low
14–62	MH	A–7–5	100	100	70	. 17	Moderate.
62–144	SC	A–6	100	100	40	(2)	Moderate.
0–8	SM	A–2–4	100	95	30	. 10	Low.
8–36	MH–CH	A–7–5	100	100	60	. 15	Moderate.
36–108	MH	A–7–5	100	100	65	(2)	Moderate.
0–9	SM	A–2–4	100	100	20	. 08	Low.
9–60	SM	A–2–4	100	100	30	. 08	Low.
0 6	SM	A–4	90	90	40	. 12	Low.
6–62	MH	A–7–5	100	100	80	. 15	Moderate.
62–144	ML	A–7–5	100	100	50	(2)	Moderate.

TABLE 5.—*Brief description of the soils of Iredell*

Map symbol	Soil	Depth to seasonally high water table	Depth to bedrock	Permeability of subsoil	Reaction	Brief description of site and soil
		Feet	*Feet*		*pH*	
CsE	Cecil soils, 15 to 25 percent slopes.					(See p. 34 for description of Cecil soils.)
CsE2	Cecil soils, 15 to 25 percent slopes, eroded.					
CsF	Cecil soils, 25 to 45 percent slopes.					
CsF2	Cecil soils, 25 to 45 percent slopes, eroded.					
CgB	Cecil gravelly fine sandy loam, 2 to 6 percent slopes.	10+	6–15	Moderate---	5.1–5.5	Well-drained soils of ridges and slopes; they consist of 3 to 15 inches of gravelly fine sandy loam over 18 to 60 inches of clay; underlain by weathered granite, gneiss, or schist.
CgB2	Cecil gravelly fine sandy loam, 2 to 6 percent slopes, eroded.					
CgC	Cecil gravelly fine sandy loam, 6 to 10 percent slopes.					
CgC2	Cecil gravelly fine sandy loam, 6 to 10 percent slopes, eroded.					
CgD	Cecil gravelly fine sandy loam, 10 to 15 percent slopes.					
CgD2	Cecil gravelly fine sandy loam, 10 to 15 percent slopes, eroded.					
CgE	Cecil gravelly fine sandy loam, 15 to 25 percent slopes.					
CgE2	Cecil gravelly fine sandy loam, 15 to 25 percent slopes, eroded.					
CtD2	Cecil stony fine sandy loam, 6 to 15 percent slopes, eroded.	10+	3–10	Moderate---	5.1–5.5	Well-drained soils on high ridges and steep slopes of the uplands; they consist of 3 to 10 inches of stony fine sandy loam over 24 to 30 inches of clay loam and 6 to 80 inches of parent material; underlain by granite, gneiss, and schist.
CuE	Cecil stony fine sandy loam, shallow, 15 to 25 percent slopes.					
CuF	Cecil stony fine sandy loam, shallow, 25 to 55 percent slopes.					
Cw	Chewacla soils.	1–3	6–20	Moderate---	5.1–5.5	Somewhat poorly drained soils of first bottoms; they consist of 6 to 14 inches of silt loam or fine sandy loam over stratified medium- to coarse-textured alluvium; subject to frequent overflow.
CxB	Colfax sandy loam, 2 to 6 percent slopes.	1–3	3½–10	Moderately slow.	4.6–5.0	Somewhat poorly drained to moderately well drained soil in depressions of the uplands and in drainageways around the heads of springs; forming in local alluvium and colluvium; it consists of 6 to 15 inches of sandy loam over 38 to 56 inches of clay loam and sandy clay; underlain by 3½ to 5 feet of weathered rock.
Cy	Congaree soils.	3–8	6–20	Moderately rapid.	5.6–6.0	Well-drained soils of the first bottoms; they consist of 6 to 15 inches of silt loam or fine sandy loam over stratified deposits of medium- to coarse-textured alluvium; subject to frequent overflow.
DaB2	Davidson clay loam, 2 to 6 percent slopes, eroded.	10+	6–20	Moderate---	5.6 6.0	Well-drained soils on ridges and side slopes in the uplands; they consist of 3 to 10 inches of loam or clay loam over 36 to 90 inches of clay; underlain by 1½ to 20 feet of weathered, dark-colored basic rock.
DaC2	Davidson clay loam, 6 to 10 percent slopes, eroded.					
HwB2	Hiwassee loam, 2 to 6 percent slopes, eroded.	10+	6–30	Moderate---	5.6 6.0	Well-drained soils of high stream terraces; they consist of 4 to 10 inches of loam over 26 to more than 128 inches of clay; underlain by unconsolidated sand and clay; in some places there are deposits of alluvium and beds of gravel.
HwC2	Hiwassee loam, 6 to 10 percent slopes, eroded.					

County, N.C., and their estimated physical properties [1]—Continued

Depth from surface (typical profile)	Classification		Percentage passing—			Selected characteristics significant in engineering—	
	Unified	AASHO	No. 4 sieve	No. 10 sieve	No. 200 sieve	Available water capacity	Shrink-swell potential
Inches						*Inches per inch*	
0-7	SM-SC	A-2-4	75	70	25	0.10	Low.
7-43	MH	A-7-5	100	100	80	.15	Moderate.
43-144	ML	A-7-5	100	100	50	(2)	Moderate.
0-7	SM	A-4	90	90	35	.11	Low.
7-35	ML-CL	A-7-6	100	100	60	.10	Moderate.
35-37	ML	A-7	90	90	50	(2)	Moderate.
0-6	ML or SM	A-4	(2)	(2)	(2)	.11	Low.
6-72	ML or SM	A-4	(2)	(2)	(2)	.11	Low.
0-11	SM	A-4	100	100	50	.10	Low.
11-24	CL	A-6	100	100	60	.13	Low.
24-48	SC	A-4 or A-6	100	100	45	(2)	Low.
0-7	SM or ML	A-4	(2)	(2)	(2)	.12	Low.
7-72	ML or SM	A-2, A-4	(2)	(2)	(2)	.12	Low.
0-6	ML-CL	A-7-6	100	100	70	.14	Moderate.
6-92	MH	A-7-5	100	100	80	.16	Moderate.
92-144	SM	A-5	95	95	45	(3)	Low.
0-6	ML	A-4	85	80	55	.14	Low.
6-128	MH	A-7-5	100	100	80	.16	Moderate.
128-180	MH	A-7-5	100	100	65	(2)	Moderate.

TABLE 5.—*Brief description of the soils of Iredell*

Map symbol	Soil	Depth to seasonally high water table	Depth to bedrock	Permeability of subsoil	Reaction	Brief description of site and soil
		Feet	*Feet*		*pH*	
IrB2	Iredell loam, 2 to 6 percent slopes, eroded.	3–5	3–5	Very slow	6. 1–6. 5	Somewhat poorly drained to moderately well drained soils on gentle slopes and in nearly level areas in the uplands; they consist of 3 to 8 inches of loam over 12 to 30 inches of very plastic clay; underlain by 20 to 24 inches of weathered basic rock.
IrC2	Iredell loam, 6 to 10 percent slopes, eroded.					
LcB3	Lloyd clay loam, 2 to 6 percent slopes, severely eroded.	10+	6–20	Moderate	5. 6–6. 0	Well-drained soils on ridges and slopes in the uplands; they consist of 3 to 10 inches of loam, fine sandy loam, or clay loam over 18 to 60 inches of clay; underlain by weathered basic or mixed acidic and basic rocks.
LcC3	Lloyd clay loam, 6 to 10 percent slopes severely eroded.					
LcD3	Lloyd clay loam, 10 to 15 percent slopes, severely eroded.					
LcE3	Lloyd clay loam, 15 to 25 percent slopes, severely eroded.					
LfB	Lloyd fine sandy loam, 2 to 6 percent slopes.					
LfB2	Lloyd fine sandy loam, 2 to 6 percent slopes, eroded.					
LfC	Lloyd fine sandy loam, 6 to 10 percent slopes.					
LfC2	Lloyd fine sandy loam, 6 to 10 percent slopes, eroded.					
LfD	Lloyd fine sandy loam, 10 to 15 percent slopes.					
LfD2	Lloyd fine sandy loam, 10 to 15 percent slopes, eroded.					
LfE	Lloyd fine sandy loam, 15 to 25 percent slopes.					
LfE2	Lloyd fine sandy loam, 15 to 25 percent slopes, eroded.					
LmB	Lloyd loam, 2 to 6 percent slopes.					
LmB2	Lloyd loam, 2 to 6 percent slopes, eroded.					
LmC	Lloyd loam, 6 to 10 percent slopes.					
LmC2	Lloyd loam, 6 to 10 percent slopes, eroded.					
LmD	Lloyd loam, 10 to 15 percent slopes.					
LmD2	Lloyd loam, 10 to 15 percent slopes, eroded.					
LmE	Lloyd loam, 15 to 25 percent slopes.					
LmE2	Lloyd loam, 15 to 25 percent slopes, eroded.					
Lo	Local alluvial land.	2–5	8–20	Rapid	(2)	Well drained to moderately well drained soil material in depressions and drainageways in the uplands; it consists of loamy sand to clay loam that is 24 inches or more thick and has been deposited recently; subject to overwash.
LuC	Louisburg and Louisa soils, 6 to 10 percent slopes.	10+	1½–4	Rapid	5. 1–5. 5	Well-drained soils on ridges and steep slopes in the uplands; they consist of 4 to 15 inches of sandy loam over 12 to 38 inches of sandy parent material; underlain by granite, gneiss, and micaceous schist; rock outcrops are common in places.
LuD	Louisburg and Louisa soils, 10 to 15 percent slopes.					
LuE	Louisburg and Louisa soils, 15 to 25 percent slopes.					
LuF	Louisburg and Louisa soils, 25 to 55 percent slopes.					
Ma	Made land.	10+	6–20	(2)	(2)	Soil materials that have been worked over and the surface layer cut at industrial sites and at the intersections of large highways.

County, N.C., and their estimated physical properties [1]—Continued

Depth from surface (typical profile)	Classification		Percentage passing—			Selected characteristics significant in engineering—	
	Unified	AASHO	No. 4 sieve	No. 10 sieve	No. 200 sieve	Available water capacity	Shrink-swell potential
Inches						*Inches per inch*	
0–6	ML	A–4	100	90	55	0.15	Low.
6–23	CH	A–7–5	100	100	90	.16	Very high.
23–40	CH	A–7–6	100	100	80	(2)	High.
0–6	ML	A–7–5	85	80	55	.14	Low.
6–45	MH	A–7–5	100	100	90	.16	Moderate.
45–144	MH	A–7–5	100	100	75	(2)	Moderate.
(2)	(2)	(2)	(2)	(2)	(2)	(2)	Low.
0–11	SM	A–2–4	95	80	30	.09	Low.
11–36	SM	A–2–4	95	85	30	.09	Low.
(2)	(2)	(2)	(2)	(2)	(2)	(2)	Low.

TABLE 5.—*Brief description of the soils of Iredell*

Map symbol	Soil	Depth to seasonally high water table	Depth to bedrock	Permeability of subsoil	Reaction	Brief description of site and soil
		Feet	*Feet*		*pH*	
MdB	Madison gravelly fine sandy loam, 2 to 6 percent slopes.	10+	1½–5	Moderate	5. 1–5. 5	Well-drained soils on narrow ridges and side slopes in the uplands; they consist of 3 to 10 inches of gravelly fine sandy loam over 12 to 24 inches of clay loam and 5 to 8 inches of parent material; underlain by micaceous schist; rock outcrops are common in places.
MdB2	Madison gravelly fine sandy loam, 2 to 6 percent slopes, eroded.					
MdC	Madison gravelly fine sandy loam, 6 to 10 percent slopes.					
MdC2	Madison gravelly fine sandy loam, 6 to 10 percent slopes, eroded.					
MdD	Madison gravelly fine sandy loam, 10 to 15 percent slopes.					
MdD2	Madison gravelly fine sandy loam, 10 to 15 percent slopes, eroded.					
MdE	Madison gravelly fine sandy loam, 15 to 25 percent slopes.					
MdE2	Madison gravelly fine sandy loam, 15 to 25 percent slopes, eroded.					
MdF	Madison gravelly fine sandy loam, 25 to 45 percent slopes.					
MfB2	Mayodan sandy loam, 2 to 6 percent slopes, eroded.	10+	10–20	Moderate	5. 1–5. 5	Well-drained soil on ridges and slopes in the uplands; it consists of 7 to 12 inches of sandy loam over 24 to 40 inches of clay; underlain by weathered sandstone or shale of Triassic age.
MhD3	Mecklenburg clay loam, 6 to 15 percent slopes, severely eroded.	7–10	4–10	Moderately slow.	5. 6–6. 0	Well-drained soils on ridges and slopes in the uplands; they consist of 3 to 12 inches of loam over 12 to 34 inches of clay; underlain by weathered, dark-colored basic rock.
MkB2	Mecklenburg loam, 2 to 6 percent slopes, eroded.					
MkC2	Mecklenburg loam, 6 to 10 percent slopes, eroded.					
MkD2	Mecklenburg loam, 10 to 15 percent slopes, eroded.					
Mm	Mixed alluvial land.	4–8	8–20	(2)	(2)	Excessively drained to moderately well drained miscellaneous soil material on first bottoms; consists of stratified or mixed sand, silt, and clay that was washed recently from soils of the uplands and terraces; subject to frequent overflow.
Mn	Mixed alluvial land, wet.	0–2	8–20	(2)		Somewhat poorly drained to very poorly drained, miscellaneous soil material on first bottoms; consists of stratified or mixed alluvial sand, silt, and clay that was washed recently from soils of the uplands and terraces; subject to frequent overflow.
MoC	Moderately gullied land, rolling.	10+	3–20	(2)	(2)	Well-drained, severely eroded soils with more than 25 percent of the surface cut by gullies; underlain by granite, gneiss, and schist.
MoD	Moderately gullied land, hilly.					
Sg	Severely gullied land.	10+	3–20	(2)	(2)	Land that is very severely eroded; more than 75 percent of the surface is cut by gullies.
St	Starr loam.	2–7	8–20	Moderate	5. 6–6. 0	Well-drained soil in depressions and drainageways and at the base of slopes in the uplands; it consists of 6 to 18 inches of loam over 18 to 30 inches of loam or clay loam; forming in colluvium and local alluvium washed from soils of the uplands; subject to overwash.

County, N.C., and their estimated physical properties[1]—Continued

Depth from surface (typical profile)	Classification		Percentage passing—			Selected characteristics significant in engineering -	
	Unified	AASHO	No. 4 sieve	No. 10 sieve	No. 200 sieve	Available water capacity	Shrink-swell potential
Inches						*Inches per inch*	
0–6	SM–SC	A–2–4	65	60	30	0. 11	Low.
6 28	MH	A–7–5	100	95	65	. 13	Moderate.
28 36	SM	A–7–6	95	90	45	(2)	Moderate.
0–6	SM	A–4	90	90	35	. 10	Low.
6–34	MH	A–7–5	100	95	70	. 15	Moderate.
34–108	MH	A–7–5	100	100	85	(2)	Low to moderate.
0–7	ML	A–4	85	80	60	. 14	Low.
7–28	MH	A–7–5	100	85	70	. 17	High.
28–40	MH	A–7–5	100	95	85	(2)	Moderate.
(2)	(2)	(2)	(2)	(2)	(2)	(2)	Low.
----------	(2)	(2)	(2)	(2)	(2)	(2)	Low.
(2)	(2)	(2)	(2)	(2)	(2)	(2)	Low.
(2)	(2)	(2)	(2)	(2)	(2)	(2)	Low.
0–8	ML–CL	A–4	100	95	75	. 15	Low.
8–68	ML–CL	A–6	100	95	75	. 17	Moderate.
68–144	(2)	(2)	(2)	(2)	(2)	(2)	(2).

TABLE 5.—*Brief description of the soils of Iredell*

Map symbol	Soil	Depth to seasonally high water table	Depth to bedrock	Permeability of subsoil	Reaction	Brief description of site and soil
		Feet	*Feet*		*pH*	
Wa	Warne and Roanoke fine sandy loams.	0–2	6–20	Slow	5. 1–5. 5	Somewhat poorly drained to poorly drained soils on low stream terraces; they consist of 6 to 12 inches of fine sandy loam over 18 to 30 inches of clay; underlain by unconsolidated alluvial sand and clay.
We	Wehadkee silt loam.	0–2	6–20	Moderate to slow.	5. 1–5. 5	Poorly drained soil on first bottoms; it consists of 4 to 8 inches of silt loam to sandy loam over stratified alluvial deposits; subject to frequent overflow.
WfB	Wickham fine sandy loam, 2 to 6 percent slopes.	10+	6–30	Moderate	5. 6–6. 0	Well-drained soils on stream terraces; they consist of 3 to 10 inches of fine sandy loam over 30 to 40 inches of clay loam; underlain by unconsolidated alluvial sand and clay.
WfB2	Wickham fine sandy loam, 2 to 6 percent slopes, eroded.					
WfC2	Wickham fine sandy loam, 6 to 10 percent slopes, eroded.					
WkC	Wilkes soils, 6 to 10 percent slopes.	10+	3–5	(2)	5. 6–6. 0	Well-drained soils on narrow ridges and steep slopes in the uplands; they consist of 4 to 8 inches of loam to clay loam and have a thin, discontinuous layer of clay loam to clay; underlain by weathered, basic or mixed acidic and basic rocks.
WkD	Wilkes soils, 10 to 15 percent slopes.					
WkE	Wilkes soils, 15 to 25 percent slopes.					
WkF	Wilkes soils, 25 to 55 percent slopes.					
Wo	Worsham loam.	0–2	3–15	Slow	5. 1–5. 6	Poorly drained soil in depressions in the uplands and in drainageways around the heads of springs; it consists of 8 to 18 inches of loam, silt loam, or sandy loam over 6 to 30 inches of sandy clay; underlain by weathered, acidic rock; subject to seepage and overwash.

[1] Properties given for the Cecil, Davidson, Lloyd, Madison, and Wilkes soils are based on data given in table 7.

County, N.C., and their estimated physical properties[1]—Continued

Depth from surface (typical profile)	Classification		Percentage passing—			Selected characteristics significant in engineering—	
	Unified	AASHO	No. 4 sieve	No. 10 sieve	No. 200 sieve	Available water capacity	Shrink-swell potential
Inches						*Inches per inch*	
0–8	SM	A–2–4	100	85	45	0.11	Low.
8–38	CH	A–7–6	100	100	80	.16	High.
38–96	SC	A–6	100	100	90	(2)	Low.
0–6	ML or CL	A–4 or A–6	(2)	(2)	(2)	.12	Low.
6–96	SC or CL	A–6 or A–7	(2)	(2)	(2)	.12	Low.
0–4	ML–CL	A–4	100	95	50	.12	Low.
4–43	MH	A–7–5	100	100	75	.16	Moderate.
43–144	MH	A–7–5	100	100	65	(2)	Low.
0–4	SM, SC	A–7–6	95	95	50	.09	Low.
4–8	MH–CH	A–7–5	100	100	65	.09	Moderate.
8–48	ML–CL	A–7–6	100	100	60	(2)	Moderate.
0–6	ML	A–7–5	85	80	55	.12	Low.
6–43	CH	A–7–6	100	100	85	.16	Moderate.
43–96	CL	A–7–6	100	100	70	(2)	Moderate.

[2] Variable.

TABLE 6.—*Suitability and characteristics of the soils*

[The characteristics are those that cause difficulty in the stated kind of construction. Dashes

Soil series and map symbols	Most suitable location of highway gradeline	Suitability of soil material as a source of		
		Topsoil	Borrow material for homogeneous earth dams and shells	Core material for earth dams
Altavista (AfB, AfB2)	Anywhere	Good	Fair	Good
Appling (AmC3, AmD3, AsB, AsB2, AsC, AsC2, AsD, AsD2, AsE, AsE2).	Anywhere	Good	Good	Good
Buncombe (Bn)	Above high water	Poor	Poor	Not suitable, poorly graded sand
Cecil (CfB, CfB2, CfC, CfC2, CfD, CfD2, CgB, CgB2, CgC, CgC2, CgD, CgD2, CgE, CgE2, CmB, CmB2, CmC, CmC2, CmD, CmD2, CsE, CsE2, CsF, CsF2).	Anywhere	Good	Fair to good	Good
Cecil, severely eroded (CcB3, CcC3, CcD3, CcE3).	Anywhere	Fair	Fair to good	Good
Cecil, stony (CtD2, CuE, CuF)	In places influenced by stones and bedrock.	Poor	Fair	Poor to fair; contains large number of stones.
Chewacla (Cw)	Above the level reached by high water and at least 30 inches above the water table.	Good	Fair to poor	Poor; poorly graded in most places.
Colfax (CxB)	At least 30 inches above the water table, which should be lowered by ditching.	Good	Good	Good
Congaree (Cy)	Above the level reached by high water.	Good	Fair to poor	Poor; poorly graded in most places.
Davidson (DaB2, DaC2)	Anywhere	Fair	Fair	Good
Hiwassee (HwB2, HwC2)	Anywhere	Fair	Fair	Good
Iredell (IrB2, IrC2)	Anywhere	Poor	Poor	Good, but plastic and difficult to work.
Lloyd (LfB, LfB2, LfC, LfC2, LfD, LfD2, LfE, LfE2, LmB, LmB2, LmC, LmC2, LmD, LmD2, LmE, LmE2).	Anywhere	Good	Fair	Good
Lloyd, severely eroded (LcB3, LcC3 LcD3, LcE3)	Anywhere	Fair	Fair	Good
Local alluvial land (Lo)	At least 30 inches above the water table.	Good	Fair	Generally poor because the soil material is poorly graded and sandy.
Louisburg and Louisa (LuC, LuD, LuE, LuF).	May be influenced by stones or bedrock.	Fair	Fair to poor	Fair to poor
Made land (Ma)	Anywhere			
Madison (MdB, MdB2, MdC, MdC2, MdD, MdD2, MdE, MdE2, MdF).	Anywhere	Fair	Fair	Good
Mayodan (MfB2)	Anywhere	Good	Fair	Good
Mecklenburg (MhD3, MkB2, MkC2, MkD2).	Anywhere	Fair	Fair to poor	Good
Mixed alluvial land (Mm)	Above the level reached by high water.	Fair	Fair to poor	Generally poor because the soil material is poorly graded and sandy.

of Iredell County, N.C., for engineering construction

indicate that the soil generally has no special characteristics that interfere with the stated use]

Suitability of soils for—			Suitability as fields for septic tanks	Agricultural drainage
Farm ponds		Terraces		
Reservoir area	Foundations of dams			
Good; generally on a large watershed.	Good; layers of sand or gravel in some places.	Suitable; short, uneven slopes.	Fair	Spot drainage may be needed for special crops; drains readily if tile or open ditches are used.
Good	Good; rock outcrops in some places.	Suitable; rock outcrops in some places.	Good	(2).
Fair; on first bottoms subject to overflow; generally on a large watershed.	Fair to poor; porous sand; requires core to a depth below pervious layers.	(1)	Poor; subject to overflow.	(2).
Good	Good; rock outcrops in some places.	Suitable; rock outcrops in some places.	Good	(2).
Good	Good; rock outcrops in some places.	Suitable; rock outcrops in some places; occasional gullies.	Good	(2).
Good	Fair; rock outcrops in many places.	Generally unsuitable; rock outcrops and boulders in many places.	Good	(2).
Fair; subject to overflow.	Fair; requires core to a depth below pervious layers.	(1)	Generally not suitable; high water table and subject to overflow.	Surface drainage is needed for most crops; drains readily if tile or open ditches are used.
Good	Good	Suitable; generally used for vegetated waterways.	Poor; high water table	Surface drainage is needed for most crops; tile or open ditches can be used.
Fair; subject to overflow; generally on a large watershed.	Fair; requires core to a depth below pervious layers.	(1)	Poor; subject to overflow.	In some places surface ditches are needed to remove surface water.
Good	Fair; high consolidation	Suitable	Good	(2).
Good	Fair; high consolidation	Suitable	Good	(2).
Good	Good	Generally unsuitable; plastic, sticky subsoil.	Poor; very slowly permeable.	Surface ditches needed in level areas.
Good	Good; rock outcrops in some places.	Suitable; rock outcrops in some places.	Good	(2).
Good	Good; rock outcrops in some places.	Suitable; rock outcrops in some places.	Good	(2).
Fair; texture is variable.	Fair; requires core to a depth below pervious layers.	Suitable; generally used for vegetated waterways.	Variable	Needed in some places; drains readily if tile or open ditches are used.
Poor; shallow to partly weathered rock.	Fair; requires core to a depth below pervious layers.	Generally unsuitable; shallow, rock outcrops.	Fair to good	(2).
Fair; shallow to partly weathered rock.	Good; shallow to partly weathered rock.	Suitable; shallow to partly weathered rock.	Good	(2).
Good	Good	Suitable	Good	(2).
Good	Good; rock outcrops in a few places.	Suitable	Fair to poor; slowly permeable.	(2).
Fair; subject to overflow; texture is variable.	Fair; requires core to a depth below pervious layers.	(1)	Poor; subject to overflow.	Needed in some places; drains readily if tile or open ditches are used.

TABLE 6.—*Suitability and characteristics of the soils*

[The characteristics are those that cause difficulty in the stated kind of construction. Dashes

Soil series and map symbols	Most suitable location of highway gradeline	Suitability of soil material as a source of—		
		Topsoil	Borrow material for homogeneous earth dams and shells	Core material for earth dams
Mixed alluvial land, wet (Mn)	Above the level reached by high water and at least 30 inches above the water table.	Poor	Fair to poor	Generally poor because the soil material is poorly graded and sandy.
Moderately gullied land (MoC, MoD).	Anywhere	Not suitable	Fair to poor	Fair to poor
Severely gullied land (Sg)	Anywhere	Not suitable	Poor	Poor
Starr (St)	Anywhere	Good	Fair	Good
Warne and Roanoke (Wa)	At least 30 inches above the water table.	Poor	Fair to poor	Good, but difficult to work
Wehadkee (We)	Above the level reached by high water and at least 30 inches above the water table.	Poor	Fair to poor	Fair to poor
Wickham (WfB, WfB2, WfC2)	Anywhere	Good	Fair to good	Fair to good
Wilkes (WkC, WkD, WkE, WkF)	In places influenced by stones and bedrock.	Fair	Fair to poor	Fair to poor
Worsham (Wo)	At least 30 inches above the water table, which should be lowered by ditching.	Poor	Fair to poor	Fair to good, but difficult to work.

[1] Terraces not needed.

Soil test data

To help evaluate the soils for engineering purposes, soil samples from the principal soil types of each of five extensive soil series were tested in accordance with standard procedures. The test data are given in table 7.

The engineering classifications in table 7 are based on data obtained by mechanical analyses and by tests to determine liquid limits and plastic limits. The mechanical analyses were made by combined sieve and hydrometer methods. Percentages of silt and clay determined by the hydrometer method should not be used in naming textural classes for soil classification. The information, however, is useful in determining the general engineering properties of the soils.

of Iredell County, N.C., for engineering construction—Continued

indicate that the soil generally has no special characteristics that interfere with the stated use]

Suitability of soils for—			Suitability as fields for septic tanks	Agricultural drainage
Farm ponds		Terraces		
Reservoir area	Foundations of dams			
Fair; subject to overflow; texture is variable.	Fair; requires core to a depth below pervious layers.	(1)	Not suitable; high water table and frequent overflow.	Needed for all crops, but outlets not generally available.
Fair; soils are variable; contain gullies.	Fair; requires core to a depth below pervious layers.	Unsuitable	Not suitable	(2).
Fair; material in soil is variable; many deep gullies.	Fair; requires core to a depth below pervious layers.	Unsuitable	Not suitable	(2).
Fair to good; in places the soil material is excessively permeable to a considerable depth.	Fair; in places requires a deep core.	Suitable; generally used for vegetated waterways.	Good	(2).
Good	Good	(1)	Poor; slowly permeable	Surface drainage needed for most crops; subsurface drainage not practical, because of slow permeability of subsoil.
Good, but subject to overflow.	Fair; requires core to a depth below pervious layers.	(1)	Not suitable; high water table and frequent overflow.	Needed for all crops; drains readily if tile or open ditches are used and if outlets are available.
Good	Fair; high consolidation; in places the substratum is permeable.	Suitable	Good	(2).
Fair; rock outcrops and ledges.	Fair; in places the substratum is permeable.	Generally unsuitable; shallow rock outcrops.	Poor; shallow to bedrock	(2).
Good	Good; seepage areas require toe drains in places.	Suitable; generally used for vegetated waterways.	Not suitable; seepage and high water table.	Needed for all crops; subject to seepage and overwash; use seepage interceptors.

[2] Drainage not needed.

The tests to show liquid limit and plastic limit measure the effect of water on the consistence of the soil material. As the moisture content of a clayey soil increases from a very dry state, the material changes from a solid to a semisolid or plastic state. As the moisture content is further increased, the material changes from the plastic to a liquid state. The *plastic limit* is the moisture content at which the soil material passes from a semisolid to a plastic state. The *liquid limit* is the moisture content at which the material passes from a plastic to a liquid state. The *plasticity index* is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content within which a soil material is in a plastic condition.

TABLE 7.—*Engineering*

Name of soil and location	Parent material	Bureau of Public Roads report number	Depth	Horizon
			Inches	
Cecil gravelly fine sandy loam:				
0.5 mile W. of Pisgah Church	Acid rock	S 36271	0–7	A_p
		S 36272	11–32	B_2
		S 36273	43–48+	C
Madison gravelly fine sandy loam:				
4.4 miles N. of Central School on State Highway 115	Schist	S 36274	0–6	A_1 and A_2
		S 36275	10–25	B_2
		S 36276	28–36+	C
Davidson clay loam:				
3 miles E. on State Highway 90 and 1.3 miles N. of Stony Point.	Hornblende gneiss	S 36277	0–6	A_p
		S 36278	6–50	B_{21}
		S 36279	108–112	C
Lloyd loam:				
0.8 mile SE. of Snow Creek Church	Hornblende mica gneiss	S 36280	½–5	A_2
		S 36281	9–21	B_{21}
		S 36282	56–68+	C_1
Wilkes soils:				
1.4 miles S. and 0.4 mile E. of Mt. Vernon Church	Basic rock	S 36283	0–4	A_p
		S 36284	4–8	B_3
		S 36285	8–12+	C

[1] Tests performed by the Bureau of Public Roads in accordance with standard procedures of the American Association of State Highway Officials (AASHO).

[2] Mechanical analyses according to the AASHO Designation: T 88–54. Results by this procedure frequently differ somewhat from results that would have been obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHO procedure, the fine material is analyzed by the hydrometer method and the various grain-size fractions are calculated on the basis of all the material, including that coarser than 2 millimeters in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method and the material coarser than 2 millimeters in diameter is excluded from calculations of grain-size fractions. The mechanical analyses used in this table are not suitable for use in naming textural classes for soils.

test data [1]

Mechanical analysis [2]									Liquid limit	Plasticity index	Classification	
Percentage passing sieve—					Percentage smaller than—							
3-in.	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.			AASHO [3]	Unified [4]
100	74	72	60	28	24	19	12	9	22	4	A-2-4(0)	SM-SC.
		100	92	79	78	76	68	62	75	31	A-7-5(20)	MH.
		100	82	51	48	39	29	23	48	13	A-7-5(5)	ML.
100	66	61	46	27	25	20	12	8	30	7	A-2-4(0)	SM-SC.
100	99	97	84	67	65	62	55	52	58	22	A-7-5(14)	MH.
100	93	91	68	45	41	34	26	22	41	13	A-7-6(3)	SM.
		100	91	69	67	62	58	53	43	18	A-7-6(11)	ML-CL.
		100	93	79	78	76	73	69	63	26	A-7-5(18)	MH.
100	95	93	78	44	41	34	21	17	47	9	A-5(2)	SM.
100	85	82	72	55	52	44	31	22	43	12	A-7-5(5)	ML.
		100	98	91	90	82	70	63	80	35	A-7-5(20)	MH.
		100	97	76	71	55	32	24	53	13	A-7-5(12)	MH.
100	97	93	80	50	46	37	28	23	45	20	A-7-6(7)	SM-SC.
		100	94	67	62	50	36	31	51	24	A-7-5(14)	MH-CH.
		100	95	58	53	40	28	22	48	19	A-7-6(9)	ML-CL.

[3] Based on Standard Specifications for Highway Materials and Methods of Sampling and Testing (Pt. 1, Ed. 8): The Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes, AASHO Designation: M 145-49.

[4] Based on the Unified Soil Classification System, Tech. Memo. No. 3-357, v. 1, Waterways Experiment Station, Corps of Engineers, March 1953.

Descriptions of the Soils

This section is provided for those who want detailed information about the soils in the county. It describes the individual soils, or mapping units; that is, the areas on the detailed soil map that are bounded by lines and identified by a symbol. For more general information about the soils, the reader can refer to the section "General Soil Map" in which the broad patterns of soils are described. The approximate acreage and proportionate extent of each soil mapped in the county are given in table 8, and their location is shown on the soil map at the back of the report. Terms used to describe the soils are given in the Glossary.

In the descriptions that follow, each soil series is first described, and then the soils in the series. The series description mentions features that apply to all of the soils it contains.

For most of the series, only one soil profile is described in detail, and that profile is described under the first mapping unit given. The profile described is considered to be representative for all the soils in the series. The descriptions of the soils in the series generally tell how their profile differs from the one described, or differences are indicated in the soil name.

TABLE 8.—*Approximate acreage and proportionate extent of the soils mapped*

Soils	Acres	Percent	Soils	Acres	Percent
Altavista fine sandy loam, 2 to 6 percent slopes	630	0.2	Cecil gravelly fine sandy loam, 15 to 25 percent slopes	969	0.3
Altavista fine sandy loam, 2 to 6 percent slopes, eroded	671	.2	Cecil gravelly fine sandy loam, 15 to 25 percent slopes, eroded	978	.3
Appling sandy loam, 2 to 6 percent slopes	689	.2	Cecil stony fine sandy loam, 6 to 15 percent slopes, eroded	198	.1
Appling sandy loam, 2 to 6 percent slopes, eroded	6, 125	1.6	Cecil stony fine sandy loam, shallow, 15 to 25 percent slopes	461	.1
Appling sandy loam, 6 to 10 percent slopes	695	.2	Cecil stony fine sandy loam, shallow, 25 to 55 percent slopes	2, 088	.5
Appling sandy loam, 6 to 10 percent slopes, eroded	5, 608	1.5	Cecil clay loam, 6 to 10 percent slopes, severely eroded	10, 186	2.7
Appling sandy loam, 10 to 15 percent slopes	540	.1	Cecil clay loam, 2 to 6 percent slopes, severely eroded	4, 742	1.2
Appling sandy loam, 10 to 15 percent slopes, eroded	2, 127	.6	Cecil clay loam, 10 to 15 percent slopes, severely eroded	6, 962	1.8
Appling sandy loam, 15 to 25 percent slopes	811	.2	Cecil clay loam, 15 to 25 percent slopes, severely eroded	5, 340	1.4
Appling sandy loam, 15 to 25 percent slopes, eroded	1, 382	.4	Chewacla soils	20, 460	5.4
Appling sandy clay loam, 6 to 10 percent slopes, severely eroded	299	.1	Colfax sandy loam, 2 to 6 percent slopes	3, 351	.9
Appling sandy clay loam, 10 to 15 percent slopes, severely eroded	245	.1	Congaree soils	2, 902	.8
Buncombe loamy sand	1, 189	.3	Davidson clay loam, 2 to 6 percent slopes, eroded	603	.2
Cecil fine sandy loam, 2 to 6 percent slopes	2, 362	.6	Davidson clay loam, 6 to 10 percent slopes, eroded	283	.1
Cecil fine sandy loam, 2 to 6 percent slopes, eroded	39, 123	10.3	Hiwassee loam, 2 to 6 percent slopes, eroded	476	.1
Cecil fine sandy loam, 6 to 10 percent slopes	2, 788	.7	Hiwassee loam, 6 to 10 percent slopes, eroded	275	.1
Cecil fine sandy loam, 6 to 10 percent slopes, eroded	35, 028	9.2	Iredell loam, 2 to 6 percent slopes, eroded	855	.2
Cecil fine sandy loam, 10 to 15 percent slopes	2, 055	.5	Iredell loam, 6 to 10 percent slopes, eroded	432	.1
Cecil fine sandy loam, 10 to 15 percent slopes, eroded	15, 070	4.0	Lloyd loam, 2 to 6 percent slopes	271	.1
Cecil sandy loam, 2 to 6 percent slopes	1, 093	.3	Lloyd loam, 2 to 6 percent slopes, eroded	9, 908	2.6
Cecil sandy loam, 2 to 6 percent slopes, eroded	13, 287	3.5	Lloyd loam, 6 to 10 percent slopes	316	.1
Cecil sandy loam, 6 to 10 percent slopes	1, 452	.4	Lloyd loam, 6 to 10 percent slopes, eroded	8, 211	2.2
Cecil sandy loam, 6 to 10 percent slopes, eroded	10, 038	2.6	Lloyd loam, 10 to 15 percent slopes	329	.1
Cecil sandy loam, 10 to 15 percent slopes	1, 026	.3	Lloyd loam, 10 to 15 percent slopes, eroded	3, 102	.8
Cecil sandy loam, 10 to 15 percent slopes, eroded	3, 961	1.0	Lloyd loam, 15 to 25 percent slopes	444	.1
Cecil soils, 15 to 25 percent slopes	12, 141	3.2	Lloyd loam, 15 to 25 percent slopes, eroded	1, 328	.3
Cecil soils, 15 to 25 percent slopes, eroded	9, 254	2.4	Lloyd fine sandy loam, 2 to 6 percent slopes	618	.2
Cecil soils, 25 to 45 percent slopes	3, 251	.9	Lloyd fine sandy loam, 2 to 6 percent slopes, eroded	17, 317	4.6
Cecil soils, 25 to 45 percent slopes, eroded	1, 029	.3	Lloyd fine sandy loam, 6 to 10 percent slopes	561	.1
Cecil gravelly fine sandy loam, 2 to 6 percent slopes	387	.1	Lloyd fine sandy loam, 6 to 10 percent slopes, eroded	11, 838	3.1
Cecil gravelly fine sandy loam, 2 to 6 percent slopes, eroded	2, 120	.6	Lloyd fine sandy loam, 10 to 15 percent slopes	322	.1
Cecil gravelly fine sandy loam, 6 to 10 percent slopes	673	.2	Lloyd fine sandy loam, 10 to 15 percent slopes, eroded	3, 851	1.0
Cecil gravelly fine sandy loam, 6 to 10 percent, slopes eroded	4, 536	1.2	Lloyd fine sandy loam, 15 to 25 percent slopes	569	.1
Cecil gravelly fine sandy loam, 10 to 15 percent slopes	755	.2	Lloyd fine sandy loam, 15 to 25 percent slopes, eroded	1, 580	.4
Cecil gravelly fine sandy loam, 10 to 15 percent slopes, eroded	3, 008	.8	Lloyd clay loam, 6 to 10 percent slopes, severely eroded	4, 201	1.1
			Lloyd clay loam, 2 to 6 percent slopes, severely eroded	2, 456	.6
			Lloyd clay loam, 10 to 15 percent slopes, severely eroded	3, 841	1.0

TABLE 8.—*Approximate acreage and proportionate extent of the soils mapped*—Continued

Soils	Acres	Percent
Lloyd clay loam, 15 to 25 percent slopes, severely eroded	2,502	0.7
Local alluvial land	4,319	1.1
Louisburg and Louisa soils, 25 to 55 percent slopes	3,178	.8
Louisburg and Louisa soils, 6 to 10 percent slopes	190	(1)
Louisburg and Louisa soils, 10 to 15 percent slopes	333	.1
Louisburg and Louisa soils, 15 to 25 percent slopes	1,314	.3
Made land	410	.1
Madison gravelly fine sandy loam, 2 to 6 percent slopes	142	(1)
Madison gravelly fine sandy loam, 2 to 6 percent slopes, eroded	1,138	.3
Madison gravelly fine sandy loam, 6 to 10 percent slopes	382	.1
Madison gravelly fine sandy loam, 6 to 10 percent slopes, eroded	2,397	.6
Madison gravelly fine sandy loam, 10 to 15 percent slopes	650	.2
Madison gravelly fine sandy loam, 10 to 15 percent slopes, eroded	2,454	.6
Madison gravelly fine sandy loam, 15 to 25 percent slopes	1,842	.5
Madison gravelly fine sandy loam, 15 to 25 percent slopes, eroded	2,325	.6
Madison gravelly fine sandy loam, 25 to 45 percent slopes	735	.2
Mayodan sandy loam, 2 to 6 percent slopes, eroded	396	.1
Mecklenburg loam, 2 to 6 percent slopes, eroded	1,069	0.3
Mecklenburg loam, 6 to 10 percent slopes, eroded	922	.2
Mecklenburg loam, 10 to 15 percent slopes, eroded	475	.1
Mecklenburg clay loam, 6 to 15 percent slopes, severely eroded	165	(1)
Mixed alluvial land, wet	2,924	.8
Mixed alluvial land	1,911	.5
Moderately gullied land, rolling	1,531	.4
Moderately gullied land, hilly	6,149	1.6
Severely gullied land	1,211	.3
Starr loam	2,470	.6
Warne and Roanoke fine sandy loams	195	.1
Wehadkee silt loam	1,067	.3
Wickham fine sandy loam, 2 to 6 percent slopes, eroded	1,118	.3
Wickham fine sandy loam, 2 to 6 percent slopes	234	.1
Wickham fine sandy loam, 6 to 10 percent slopes, eroded	812	.2
Wilkes soils, 6 to 10 percent slopes	1,112	.3
Wilkes soils, 10 to 15 percent slopes	1,270	.3
Wilkes soils, 15 to 25 percent slopes	3,605	1.0
Wilkes soils, 25 to 55 percent slopes	6,442	1.7
Worsham loam	743	.2
Other	36	(1)
Total land area	378,240	99.5
Water	1,920	.5
Total area of county	380,160	100.0

[1] Less than 0.1 percent.

In describing the profile, a letter symbol, for example A_1, was assigned to each of the various horizons, or layers. These letter symbols have special meanings for soil scientists and others who desire to make a special study of soils. Most readers will need to remember only that all of the letter symbols beginning with "A" are surface layer; those beginning with "B" are subsoil; those beginning with "C" are the substratum, or parent material; and those beginning with "D" are bedrock.

The color of each horizon can be described in words, such as yellowish brown, but it can also be indicated by symbols for the hue, value, and chroma, such as 10YR 5/4. These symbols, called Munsell color notations (*12*), are used by soil scientists to evaluate the color of the soil precisely. For the profiles described, the names of the colors and the color symbols are given for moist soil unless stated otherwise.

In this report, as a rule, the darker the surface layer of the profile described, the more organic matter it contains. Streaks and spots of gray and yellow generally indicate that drainage is restricted or that the soil is poorly aerated.

The boundaries between horizons are described so as to indicate their thickness and shape. The terms for thickness are *abrupt*, *clear*, *gradual*, and *diffuse*. The shape of the boundary is described as *smooth*, *wavy*, *irregular*, or *broken*.

The texture of the soil refers to the content of sand, silt, and clay. It is determined by the way the soil feels when it is rubbed between the fingers, and is later checked by laboratory analysis.

Structure is indicated by the way the individual soil particles are arranged in larger grains, or aggregates, and the amount of pore space between the grains. The structure of the soil is determined by the strength or grade, the size, and the shape of the aggregates. For example, a horizon may have weak, fine, granular structure.

Altavista Series

The Altavista series consists of deep, gently sloping, moderately well drained to well drained soils on low stream terraces. The surface layer is light-gray to dark-brown, friable fine sandy loam. The subsoil is yellow to yellowish-brown, friable or firm sandy clay, clay loam, or clay that is 20 to 50 inches thick. There is a layer of rounded stones just below the subsoil in many places. Generally, gray mottling occurs at a depth of 24 inches or more, and in most places there is some mottling in the lower part of the subsoil. The parent material is old deposits of alluvial material.

These soils are near the Warne, Roanoke, Wickham, and Hiwassee soils. They are brighter colored and better drained than the Warne and Roanoke soils, and the upper part of their subsoil is less mottled. The Altavista soils are less red and less well drained than the Wickham and the Hiwassee soils, and they are in a lower position on the terraces. Their subsoil is also finer textured than that of the Wickham soils.

The Altavista soils are low in fertility and in organic matter. They are medium acid and have moderate available water capacity and moderate permeability. The soils are easy to till. They are suited to many different kinds of crops, but in some places tile drains or ditches are needed to improve the areas for crops that require good drainage. Crops on these soils respond well if lime and fertilizer are added.

These soils are important locally, but they occupy only a small acreage. Most of the acreage is used for row crops and pasture.

Altavista fine sandy loam, 2 to 6 percent slopes (AfB).—This moderately well drained to well drained soil is on terraces along the large streams in the county. Its A horizon is light-gray to dark-brown, friable fine sandy loam. The B horizon is yellow to yellowish-brown, friable or firm sandy clay, clay loam, silty clay, or clay that is mottled with gray and red.

The following describes a representative profile in a forested area on property owned by the Statesville Country Club, 0.5 mile south of the clubhouse, 400 feet east of the road:

A_{00}—1½ inches to ½ inch of hardwood leaves and twigs.
A_0—½ inch or less of highly decomposed organic matter.
A_1—0 to 3 inches, grayish-brown (2.5Y 5/2) fine sandy loam; weak, medium, granular structure; very friable; medium acid; clear, smooth boundary.
A_2—3 to 14 inches, light yellowish-brown (2.5Y 6/4) fine sandy loam; weak, coarse, granular structure; very friable; medium acid; clear, smooth boundary.
B_1—14 to 17 inches, olive-yellow (2.5Y 6/6) to light olive-brown (2.5Y 5/6) sandy clay loam; weak, fine, subangular blocky structure; friable; medium acid; clear, smooth boundary.
B_{21}—17 to 28 inches, light olive-brown (2.5Y 5/6 to 6/6) to yellowish-brown (10Y 5/6) clay loam; moderate, medium, subangular blocky structure; friable; prominent, continuous clay films; strongly acid; gradual, wavy boundary.
B_{22}—28 to 41 inches, brownish-yellow (10YR 6/6) clay; common, medium, prominent mottles of red (2.5YR 4/8) and a few, medium, faint mottles of pale yellow (5Y 7/3); the mottles are more numerous in the lower part of the horizon; moderate, medium, subangular blocky structure; friable; prominent, continuous clay films; strongly acid; gradual, wavy boundary.
B_3—41 to 62 inches, yellowish-brown (10YR 5/8) clay; common, coarse, prominent mottles of red (2.5YR 4/8) and common, coarse, distinct mottles of pale yellow (5YR 7/3); weak, medium, subangular blocky structure; friable; prominent, discontinuous clay films; strongly acid; gradual, irregular boundary.
C_1—62 to 74 inches, gray, yellow, and red saprolite composed of clay that contains lenses of sand the size of fragments of rock; massive; very strongly acid; gradual, irregular boundary.
C_2—74 to 86 inches, gray clay that contains lenses of sand; a few yellow mottles; massive (structureless); very strongly acid; clear, wavy boundary.
C_3—86 to 88 inches +, light-gray and pale-yellow sandy clay loam; massive; a few quartz fragments that are ¼ inch or smaller in diameter; very strongly acid.

The A horizon ranges from light gray to dark brown in color and from 6 to 18 inches in thickness. The color of the B horizon is yellow or olive yellow to yellowish brown, and the horizon is mottled with gray and red. It ranges from 20 to 50 inches in thickness. The A and B horizons combined are generally 30 inches or more thick.

In some places slopes are less than 2 percent, and in others they are more than 6 percent. In a few areas there are some rounded stones and pebbles on the surface.

Mapped with this soil are some areas of a soil that has a surface layer of silt loam. Also included are a few areas of a soil in which the subsoil is finer textured than in the profile described.

Altavista fine sandy loam, 2 to 6 percent slopes, is medium acid, and it is low in fertility and in organic matter. Available water capacity and permeability are moderate. Crops on this soil respond well if lime and fertilizer are added.

Most of this soil is well suited to cultivated crops. The soil is also well suited to pasture and trees. (Capability unit IIe–1; woodland group 3A)

Altavista fine sandy loam, 2 to 6 percent slopes, eroded (AfB2).—This soil has a browner, thinner surface layer than Altavista fine sandy loam, 2 to 6 percent slopes. In a few areas there are some rounded stones or pebbles on the surface.

Mapped with this soil are some areas that have a surface layer of silt loam. Also included are a few areas in which the subsoil is finer textured than in the profile described.

Altavista fine sandy loam, 2 to 6 percent slopes, eroded, is suited to field crops and to pasture and trees. Most of it is cultivated or is used for pasture. This soil has less favorable tilth than Altavista fine sandy loam, 2 to 6 percent slopes. It is also harder to get a good stand of the crops that are grown, and yields are lower. (Capability unit IIe–1; woodland group 3B)

Appling Series

The Appling series consists of deep, gently sloping to moderately steep, well-drained soils of the uplands. In the less eroded areas, the surface layer is grayish-brown, light olive-brown, or light yellowish-brown, friable sandy loam. The subsoil is yellowish-red to strong-brown, firm clay or sandy clay and is generally mottled with red and yellow. In most places depth to the bedrock of granite and granite gneiss is more than 5 feet, but in some places it is more than 15 feet.

These soils are near the Cecil, Colfax, Mayodan, Louisburg, and Louisa soils. They have a thicker surface layer and yellower subsoil than the Cecil soils, and in most places there is more sand throughout the profile. The Appling soils have a redder subsoil and are better drained than the Colfax soils. In appearance they are similar to the Mayodan soils, but they overlie granite and gneiss rather than Triassic sandstone. The Appling soils are deeper than the Louisburg and Louisa soils, and their subsoil is better developed.

The Appling soils are low in fertility and organic matter, and they are strongly acid. Available water capacity and permeability are moderate. The soils are easy to till and can be tilled over a wide range of moisture content. Crops on these soils respond well to lime and fertilizer.

Areas of these soils are in all parts of the county. The largest area is east of Statesville between U.S. Highways Nos. 64 and 70 and extending south to near Amity. These soils are important for agriculture, and much of the acreage is cultivated or used for pasture. The less eroded areas are suited to many different crops, but they are especially well suited to tobacco and cotton.

Appling sandy loam, 2 to 6 percent slopes (AsB).—This well-drained soil is on gently rolling ridges of the uplands. It occurs in all parts of the county, except in those areas underlain by basic rock. The A horizon is grayish-brown to light yellowish-brown, friable sandy loam. The B horizon is yellowish-red to strong-brown, firm clay or sandy clay that is mottled with red and yellow.

The following describes a representative profile in a pasture 20 feet south of a paved road, 2⅓ miles east of Oswalt:

A_p—0 to 8 inches, light yellowish-brown (10YR 6/4) sandy loam; weak, medium and fine, granular structure; very friable; abundant grass roots; strongly acid; abrupt, wavy boundary.

B_1—8 to 11 inches, strong-brown (7.5YR 5/6) sandy clay loam; common, coarse, prominent mottles of brownish yellow (10YR 6/6); weak, medium, subangular blocky structure; friable; plentiful, small, woody roots; very strongly acid; clear, wavy boundary.

B_{21}—11 to 20 inches, yellowish-red (5YR 5/6) clay; a few, coarse, prominent mottles of olive yellow (2.5Y 6/6); moderate, medium, subangular blocky structure; friable or firm; prominent, continuous clay films; plentiful, small, woody roots; very strongly acid; clear, wavy boundary.

B_{22}—20 to 25 inches, yellowish-red (5YR 5/6) sandy clay; common, coarse, prominent mottles of olive yellow (2.5Y 6/6); moderate, medium, subangular blocky structure; friable; prominent, continuous clay films; a few, small woody roots; strongly acid; clear, wavy boundary.

B_{23}—25 to 32 inches, yellowish-red (5YR 5/6) clay loam; common, medium, prominent mottles of yellowish brown (10YR 5/6) and a few, coarse, distinct mottles of red (2.5YR 4/6); moderate, medium and coarse, subangular and angular blocky structure; friable; prominent, continuous clay films; strongly acid; clear, wavy boundary.

B_3—32 to 36 inches, yellowish-red (5YR 4/6) sandy clay loam; common, medium, prominent mottles of reddish yellow (7.5YR 6/8); moderate, medium, subangular and angular blocky structure; friable; distinct, discontinuous clay films; some weathered parent material; strongly acid; clear, wavy boundary.

C—36 to 40 inches +, red and yellow, disintegrated parent material of granite gneiss; massive.

The A horizon ranges from grayish brown or light olive brown to light yellowish brown in color and from 6 to 12 inches in thickness. The B horizon is yellowish red to strong brown and is 20 to 50 inches thick. The A and B horizons combined are generally 36 inches or more thick.

In some small areas near Amity, the soil has a fairly high content of mica. In a few small areas, the slope is less than 2 percent. There are enough stones or pebbles in a few small areas to interfere with tillage. In a few places the soil has a surface layer of fine sandy loam.

Mapped with this soil is a soil that has a surface layer of grayish-brown sandy loam. In those areas the subsoil is yellow or brownish-yellow, moderately firm sandy clay, clay loam, or clay that in places is streaked with light red and gray at a depth below 30 inches. Areas of this included soil are too small to be mapped separately.

Appling sandy loam, 2 to 6 percent slopes, is low in fertility and organic matter, and it is strongly acid. Available water capacity and permeability are moderate. Crops grown on this soil respond well if lime and fertilizer are added.

This soil is suited to row crops, especially tobacco. It is also suited to small grains, hay, pasture, and trees. Much of the acreage is in forests consisting of old growth or of areas that have been cut over, but some of it is cultivated or in pasture. If the soil is cultivated, practices are needed to protect it from erosion. (Capability unit IIe–1; woodland group 4A)

Appling sandy loam, 2 to 6 percent slopes, eroded (AsB2).—This soil is on gently rolling ridges. It has a thinner surface layer than Appling sandy loam, 2 to 6 percent slopes. The surface layer is commonly light yellowish-brown sandy loam, and it is 3 to 6 inches thick.

In many small areas this soil is severely eroded, and in those areas the surface layer is brownish-yellow sandy clay loam. There are a few gullies, and some of them are deep. In some small areas near Amity, the soil has a fairly high content of mica. In a few small areas, the soil has a surface layer of fine sandy loam. In a few places there are enough stones or pebbles to interfere with tillage.

Mapped with this soil are small areas of a soil that has a surface layer of grayish-brown sandy loam. In those areas the subsoil is yellow or brownish-yellow, moderately firm sandy clay, clay loam, or clay that in places is streaked with light red and gray at a depth below 30 inches. Areas of this included soil are too small to be mapped separately.

Appling sandy loam, 2 to 6 percent slopes, eroded, is suited to row crops, especially tobacco, and it is also suited to small grains, hay, pasture, and trees. This soil is used mainly for cultivated crops or pasture, but in some places there are good stands of shortleaf and Virginia pines. If the soil is cultivated, practices are needed to protect it from erosion. (Capability unit IIe–1; woodland group 4B)

Appling sandy loam, 6 to 10 percent slopes (AsC).—This soil is on ridges and side slopes in rolling and gently rolling areas. In some small areas near Amity, the soil has a fairly high content of mica. In a few small areas, the surface layer is fine sandy loam. There are enough stones or pebbles to interfere with tillage in a few places.

Mapped with this soil are small areas of a soil that has a surface layer of grayish brown sandy loam. The subsoil in these included areas is yellow or brownish-yellow, moderately firm sandy clay loam or clay that in places is streaked with light red and gray at a depth below 30 inches. Areas of these included soils are too small to be mapped separately.

Appling sandy loam, 6 to 10 percent slopes, is suited to row crops, especially tobacco, but it is also suited to small grains, hay, pasture, and trees. This soil is mainly in forests consisting of old growth or of areas that have been cut over, but some of the acreage is cultivated or in pasture. If it is cultivated, the soil requires intensive practices to protect it from erosion. (Capability unit IIIe–1; woodland group 4A)

Appling sandy loam, 6 to 10 percent slopes, eroded (AsC2).—This soil is on ridges and side slopes in areas that are gently rolling or rolling. It has a thinner surface layer than Appling sandy loam, 2 to 6 percent slopes. The surface layer in most places is light yellowish brown and is 3 to 6 inches thick.

In many small areas this soil is severely eroded and the surface layer is brownish-yellow sandy clay loam. There are a few gullies, and some of them are deep. In some small areas near Amity, the soil has a fairly high content of mica. The surface layer in a few areas is fine sandy

loam. In a few places there are enough stones or pebbles to interfere with tillage.

Mapped with this soil are some areas of a soil that has a surface layer of grayish-brown sandy loam. In such areas the subsoil is yellow or brownish-yellow, moderately firm sandy clay, clay loam, or clay that is streaked in places with light red and gray at a depth below 30 inches. Areas of this included soil are too small to be mapped separately.

Appling sandy loam, 6 to 10 percent slopes, eroded, is suited to row crops, especially tobacco. It is also suited to small grains, hay, pasture, and trees. Most of it is cultivated or in pasture, but in some places there are good stands of shortleaf and Virginia pines. If the soil is cultivated, intensive practices are required to protect it from further erosion. (Capability unit IIIe–1; woodland group 4B)

Appling sandy loam, 10 to 15 percent slopes (AsD).—This soil is generally on side slopes that border drainageways. It is shallower over granite or granite gneiss than Appling sandy loam, 2 to 6 percent slopes.

In some small areas near Amity, this soil has a fairly high content of mica. In a few small areas, the surface layer is fine sandy loam. There are a few rock outcrops in places, and there are enough stones or pebbles in a few areas to interfere with tillage.

Appling sandy loam, 10 to 15 percent slopes, is suited to row crops, especially tobacco. It is also suited to small grains, hay, pasture, and trees. Some areas are in forests consisting of old growth or of areas that have been cut over, and others are cultivated or in pasture. If it is cultivated, intensive practices are required to protect this strongly sloping soil from serious erosion. (Capability unit IVe–1; woodland group 4A)

Appling sandy loam, 10 to 15 percent slopes, eroded (AsD2).—This soil is generally on side slopes that border drainageways. It has a thinner surface layer than Appling sandy loam, 2 to 6 percent slopes. The surface layer commonly is light yellowish brown and is 3 to 5 inches thick.

In many small areas this soil is severely eroded, and in those areas the surface layer is brownish-yellow sandy clay loam. There are a few gullies, and some of them are deep. In some small areas near Amity, the soil has a fairly high content of mica. In a few areas the surface layer is fine sandy loam. There are a few rock outcrops in places, and in a few small areas there are stones or pebbles that interfere with tillage.

Appling sandy loam, 10 to 15 percent slopes, eroded, is suited to row crops, small grains, hay, and pasture, and it is also suited to trees. All of it has been cleared. In some places shortleaf and Virginia pines have reseeded, and some areas are cultivated or in pasture. Because of the strong slope and the hazard of further erosion, intensive practices are needed if this soil is cultivated. (Capability unit IVe–1; woodland group 4B)

Appling sandy loam, 15 to 25 percent slopes (AsE).—This soil is generally on side slopes that border deeply cut drainageways. It is shallower than Appling sandy loam, 2 to 6 percent slopes, and its profile is not so well developed. In only a few places is the soil more than 36 inches thick.

In some small areas near Amity, this soil has a fairly high content of mica. The surface layer in a few areas is fine sandy loam. There are a few rock outcrops and a few small areas in which the soil is gravelly or stony. In a few places the slope is more than 25 percent.

Appling sandy loam, 15 to 25 percent slopes, is not suited to row crops, because it is susceptible to erosion. Much of it is in shortleaf and Virginia pines and hardwoods of low quality. If this soil is cleared, it is best to use it for pasture or hay crops. (Capability unit VIe–1; woodland group 4A)

Appling sandy loam, 15 to 25 percent slopes, eroded (AsE2).—This soil generally is on side slopes that border deeply cut drainageways. It has a thinner surface layer than Appling sandy loam, 2 to 6 percent slopes, and its profile is not so well developed. The surface layer in most places is light yellowish brown and is 3 to 5 inches thick.

In many small areas this soil is severely eroded and has a surface layer of brownish-yellow sandy clay loam. There are a few gullies, and some of them are deep. In some small areas near Amity, the soil has a fairly high content of mica. The surface layer in a few areas is fine sandy loam. There are rock outcrops in places, and in small areas the soil is gravelly or stony. In a few places the slope is more than 25 percent.

Appling sandy loam, 15 to 25 percent slopes, eroded, is not suited to row crops, because it is highly susceptible to erosion. All of it has been cleared, but some of it has reseeded to shortleaf and Virginia pines. Some of it is still cultivated or used for pasture. If this soil is cleared, it is best to use it for pasture or hay crops. (Capability unit VIe–1; woodland group 4B)

Appling sandy clay loam, 6 to 10 percent slopes, severely eroded (AmC3).—This soil has a thinner, finer textured surface layer than Appling sandy loam, 2 to 6 percent slopes, and it is shallower over granite or granite gneiss. The surface layer is brownish-yellow sandy clay loam, and it is 4 to 6 inches thick. It consists mostly of material from the former subsoil that has been mixed with sandy loam from the original surface layer.

In some places as much as one-fourth of an area is a network of shallow gullies. In a few areas the slope is less than 6 percent.

Appling sandy clay loam, 6 to 10 percent slopes, severely eroded, has poorer tilth than Appling sandy loam, 2 to 6 percent slopes. It is also more droughty and takes in water more slowly. This soil can be worked within only a narrow range of moisture content. Because of the fine texture of the surface layer, the surface of the soil puddles and crusts after a hard rain. Therefore, it is difficult to obtain a good stand of the crops that are grown.

This soil is suited to small grains and to hay and pasture crops. It can be used for row crops if intensive practices are used to control further erosion. At the present time, however, much of it is covered with broomsedge, briers, honeysuckle, and a scattering of Virginia pines. Some areas have reseeded to almost pure stands of Virginia pine, but some of the acreage is still cultivated. (Capability unit IVe–2; woodland group 4C)

Appling sandy clay loam, 10 to 15 percent slopes, severely eroded (AmD3).—This soil has a thinner, finer textured surface layer than Appling sandy loam, 2 to 6 percent slopes, and it is shallower over granite and granite gneiss. The surface layer is brownish-yellow sandy clay

loam that is 4 to 6 inches thick. It consists mostly of material from the former subsoil that has been mixed with sandy loam from the original surface layer.

In some places as much as one-fourth of the area is a network of shallow gullies. In a few areas the slope is more than 15 percent.

Appling sandy clay loam, 10 to 15 percent slopes, severely eroded, has poorer tilth than Appling sandy loam, 2 to 6 percent slopes. It is also more droughty and takes in water more slowly. The soil can be worked only within a narrow range of moisture content. Because of the fine texture of the surface layer, the surface of the soil puddles and crusts after a hard rain. It is, therefore, difficult to get a good stand of the crops that are grown. If it is cleared, the soil is best used to grow hay, pasture, or trees. Much of it is covered with broomsedge, briers, honeysuckle, and a scattering of Virginia pines, but some areas have reseeded to almost pure stands of Virginia pine. Some of the acreage is cultivated. (Capability unit VIe-2; woodland group 4C)

Buncombe Series

The Buncombe series consists of deep, nearly level, excessively drained soils on flood plains along the large streams of the county. The surface layer is light yellowish brown, loose loamy sand. It is underlain by loamy sand and sand that is 30 inches or more thick and that is stratified in many places. The soils lack a B horizon. The parent material of these soils is recent alluvial deposits.

These soils are near the Congaree soils. They are coarser textured than the Congaree soils, and they have more rapid permeability.

The Buncombe soils are low in fertility and organic matter and are medium acid. They are low in available water capacity and have rapid permeability. The soils have excellent tilth and can be worked over a wide range of moisture content. They are droughty but are subject to frequent overflow. The soils can be used to grow corn, truck crops, small grains, and pasture crops.

These soils occupy only a small acreage. They are not important for agriculture.

Buncombe loamy sand (Bn).—This is the only Buncombe soil mapped in the county, and it is nearly level and excessively drained. The soil is on first bottoms adjacent to large streams where it is subject to frequent overflow. The A horizon is light-gray to dark yellowish-brown, loose loamy sand. It is underlain by loamy sand and sand. The following describes a representative profile in a cultivated field, 200 feet south of the South Yadkin River Bridge and 150 feet east of State Highway 115:

A_p—0 to 9 inches, dark yellowish-brown (10YR 4/4) loamy sand; single grain; loose; plentiful, small, fibrous roots; a few, finely divided mica flakes; slightly acid; a layer of yellowish-brown coarse sand that is less than ¼ inch thick between the A_p and C_1 horizons; abrupt, wavy boundary.

C_1—9 to 16 inches, dark yellowish-brown (10YR 4/4) loamy sand; single grain; loose; a few, small, fibrous roots; a few, finely divided mica flakes; strongly acid; abrupt, wavy boundary.

C_2—16 to 27 inches, light yellowish-brown (10YR 5/4) loamy sand; dark yellowish-brown (10YR 4/4) stratifications; single grain; loose; a few, medium mica flakes; medium acid; abrupt, smooth boundary.

C_3—27 to 32 inches, yellowish-brown (10YR 5/4) loamy sand; single grain; loose; a few, medium mica flakes; medium acid; abrupt, smooth boundary.

C_4—32 to 55 inches +, white (10YR 8/2) coarse sand and a few grains of reddish-yellow and black minerals; single grain; loose; a few, fine and medium mica flakes; slightly acid.

The A horizon ranges from light gray to dark yellowish brown in color and from 6 to 12 inches in thickness. The C horizon is loamy sand and sand and is 30 inches or more thick.

Mapped with this soil are some areas of a soil that has a surface layer of loamy fine sand. Areas of this included soil are too small to be mapped separately.

Buncombe loamy sand is low in fertility and organic matter, and it is medium acid. It has low available water capacity and rapid permeability. This soil is easy to till. Crops grown on it respond well if lime and fertilizer are added.

This soil can be used for corn, small grains, truck crops, and pasture. Most of the acreage is already cultivated or in pasture. (Capability unit IIIs-1; woodland group 8)

Cecil Series

The Cecil series consists of deep, nearly level to steep, well-drained soils of the uplands. In the less eroded areas, the surface layer is grayish-brown, friable sandy loam or fine sandy loam and the subsoil is red, firm clay. In most places the bedrock is at a depth of more than 5 feet, but in many places it is at a depth of more than 15 feet. The bedrock is chiefly granite and gneiss, but it includes some mica schist.

These soils are near the Appling, Lloyd, Wilkes, Louisburg, and Louisa soils. They have a thinner surface layer and a redder subsoil than the Appling soils, and in most places they have less sand throughout the profile. The Cecil soils generally have a lighter colored surface layer and a less red, more sandy subsoil than the Lloyd soils, and they are underlain by a different kind of bedrock. The Cecil soils are deeper than the Louisburg and Louisa soils and have a thicker, more strongly developed subsoil. Also, they lack the high content of mica that is typical of the Louisa soils. The Cecil soils are deeper than the Wilkes soils, and they have a thicker, better developed subsoil.

The Cecil soils are low in natural fertility and organic matter and are strongly acid. They have moderate available water capacity and permeability. These soils are easy to till and can be worked over a wide range of moisture content. Crops grown on them respond well if lime and fertilizer are added.

These soils are extensive, and they occur in all parts of the county. Much of the acreage is cultivated or in pasture. The less eroded areas are suited to many different kinds of crops.

Cecil fine sandy loam, 2 to 6 percent slopes (CfB).—This well-drained soil is on gently rolling ridges in the uplands. It occupies a large acreage in all parts of the county, except near Elmwood and southeast of Mooresville. The A horizon is brown to grayish-brown, friable fine sandy loam. The B horizon is red, friable or firm clay.

The following describes a representative profile in a cultivated field, north of Society Church:

A_p—0 to 6 inches, dark yellowish-brown (10YR 4/4) fine sandy loam; weak, medium and fine, granular structure; very friable; abundant, small, fibrous roots; strongly acid; abrupt, smooth boundary.

B_1—6 to 9 inches, yellowish-red (5YR 4/8) sandy clay loam; moderate, fine to medium, subangular blocky structure; friable; a few, thin, discontinuous clay films; plentiful, small, woody roots; a few, fine mica flakes; coatings of strong brown (7.5YR 5/6); very strongly acid; clear, wavy boundary.

B_{21}—9 to 13 inches, red (2.5YR 4/8) clay; moderate, fine and medium, subangular blocky structure; friable; thin, common, distinct, nearly continuous clay films; plentiful, small, woody roots; a few, fine mica flakes; very strongly acid; gradual, wavy boundary.

B_{22}—13 to 26 inches, red (2.5YR 4/8) clay; moderate, medium and fine, subangular blocky structure; firm; distinct, thick, nearly continuous clay films; a few, fine, woody roots; a few, fine mica flakes; coatings of red (10R 4/8); strongly acid; gradual, smooth boundary.

B_{23}—26 to 38 inches, red (2.5YR 4/8) clay; moderate, fine and medium, subangular blocky structure; firm; thick, distinct, continuous clay films; a few, fine, woody roots; a few, fine mica flakes; strongly acid; gradual, smooth boundary.

B_{31}—38 to 46 inches, red (2.5YR 4/8) clay; moderate, medium, subangular blocky structure; friable; thick, prominent, discontinuous clay films; a few, fine, woody roots; a few, coarse mica flakes, and a few fragments of mica gneiss; a few yellowish streaks; strongly acid; diffuse, irregular boundary.

B_{32}—46 to 66 inches, red (2.5YR 4/8) clay; weak, medium, subangular blocky structure that breaks to fine, subangular blocky; friable; thick, prominent, discontinuous clay films, mostly on the vertical faces of peds; a few, small, woody roots; common, fine mica flakes, and common fragments of soft, weathered rock; prominent spots of reddish yellow from the weathered rock; strongly acid; diffuse, irregular boundary.

C—66 to 78 inches, red and reddish-yellow clay loam; massive; very friable; common, fine mica flakes; numerous fragments of weathered rock.

In areas that are cultivated, the A horizon is grayish brown or dark yellowish brown to reddish brown, but it is olive brown in some areas that are wooded. The A horizon is 4 to 15 inches thick. The B horizon is red and ranges from 18 to 60 inches in thickness. The A and B horizons combined generally are more than 36 inches thick, but in the southwestern part of the county they are only 22 to 36 inches thick.

In some places this soil has a fairly high content of mica. In a few small areas, there are enough stones or pebbles to interfere with tillage. The slope is less than 2 percent in a few small areas.

Mapped with this soil are a few areas of a soil that has a similar profile, but is on foot slopes and colluvial fans. This included soil formed in old local alluvium. Also included are a few areas of a soil near the community of V-Point that also has a similar profile, but is underlain by Triassic sandstone. Areas of these included soils are too small to be mapped separately.

Cecil fine sandy loam, 2 to 6 percent slopes, is low in fertility and organic matter and is strongly acid. It is moderate in available water capacity and in permeability. Crops on this soil respond well if lime and fertilizer are added.

This soil is suited to row crops, small grains, hay, and pasture, and it is also suited to trees. Much of the acreage is in forest consisting of old growth or of areas that have been cut over, but some areas are cultivated or are in pasture. If this soil is cultivated, practices are needed to protect it from erosion. (Capability unit IIe–1; woodland group 4A)

Cecil fine sandy loam, 2 to 6 percent slopes, eroded (CfB2).—This soil has a thinner surface layer than Cecil fine sandy loam, 2 to 6 percent slopes. In most places the surface layer is reddish-brown fine sandy loam and is 3 to 7 inches thick.

In many small areas this soil is severely eroded and has a surface layer of red clay loam. There are a few gullies, and some of them are deep. In some areas this soil has a fairly high content of mica. Stones or pebbles interfere with tillage in a few small areas.

Mapped with this soil are a few areas of a soil that has a profile similar to that of the Cecil fine sandy loam described. The included soil is on foot slopes and colluvial fans, however, and formed in old local alluvium. Also included are a few areas of a soil near the community of V-Point, where the profile is also similar to the one described but is underlain by Triassic sandstone. Areas of the included soils are too small to be mapped separately.

Cecil fine sandy loam, 2 to 6 percent slopes, eroded, is suited to row crops, small grains, hay, and pasture, and it is also suited to trees. Most of it is cultivated or in pasture, but some of the areas have good stands of shortleaf and Virginia pines. If this soil is cultivated, practices are required to protect it from further erosion. (Capability unit IIe–1; woodland group 4B)

Cecil fine sandy loam, 6 to 10 percent slopes (CfC).—This soil is on rolling ridges or on gently rolling side slopes. In places it has a fairly high content of mica. In a few small areas, stones or pebbles interfere with tillage.

Mapped with this soil are a few areas of a soil that has a profile similar to that of the Cecil fine sandy loam described. This included soil is on foot slopes and colluvial fans, however, and is underlain by old local alluvium. Also included are a few areas of a soil near the community of V-Point, where the profile is also similar to the one described but is underlain by Triassic sandstone. Areas of these included soils are too small to be mapped separately.

Cecil fine sandy loam, 6 to 10 percent slopes, is suited to row crops, small grains, hay, and pasture, and it is also suited to trees. Much of the acreage is in forests consisting of old growth or of areas that have been cut over, but some of it is cultivated or in pasture. If this soil is cultivated, intensive practices are required to protect it from erosion. (Capability unit IIIe–1; woodland group 4A)

Cecil fine sandy loam, 6 to 10 percent slopes, eroded (CfC2).—This soil has a thinner surface layer than Cecil fine sandy loam, 2 to 6 percent slopes. The surface layer in most places is reddish-brown fine sandy loam that is 3 to 5 inches thick.

In many small areas this soil is severely eroded and has a surface layer of red clay loam. There are a few gullies, and some of them are deep. In some places the soil has a fairly high content of mica. In a few small areas, stones and pebbles interfere with tillage.

Mapped with this soil are a few areas of a soil that has a profile similar to that of the Cecil fine sandy loam described. The included soil is on foot slopes and colluvial fans, however, and is underlain by old local alluvium.

Also included are a few areas of a soil near the community of V-Point, where the profile is also similar to the one described but is underlain by Triassic sandstone. Areas a profile similar to that of the Cecil fine sandy loam described. The included soil is on foot slopes and colluvial fans, however, and is underlain by old local alluvium.

Figure 4.—**Alternate strips of a small grain and red clover on Cecilfine sandy loam, 6 to 10 perecent slopes, eroded. In the background is a 20-year-old stand of loblolly pine.**

of the included soils are too small to be mapped separately.

Cecil fine sandy loam, 6 to 10 percent slopes, eroded, (fig. 4) is suited to row crops, small grains, pasture, and hay crops. Much of the acreage is cultivated or is in pasture, but some of it has good stands of shortleaf and Virginia pines. If the soil is cultivated, intensive practices are required to protect it from further erosion. (Capability unit IIIe–1; woodland group 4B)

Cecil fine sandy loam, 10 to 15 percent slopes (CfD).—This soil is generally on side slopes that border drainageways. It is shallower over bedrock than Cecil fine sandy loam, 2 to 6 percent slopes.

In some places this soil has a fairly high content of mica. There are a few rock outcrops in places, and, in a few small areas, stones or pebbles interfere with tillage.

Mapped with this soil are a few areas of a soil that has Areas of this included soil are too small to be mapped separately.

In some places Cecil fine sandy loam, 10 to 15 percent slopes, has good stands of shortleaf and Virginia pines and of hardwoods of low quality. In other places this soil has been cleared and has been used for row crops, small grains, hay, and pasture. If the soil is cultivated, intensive practices are required to control erosion. (Capability unit IVe–1; woodland group 4A)

Cecil fine sandy loam, 10 to 15 percent slopes, eroded (CfD2).—This soil is generally on side slopes that border drainageways. It is shallower over bedrock than Cecil fine sandy loam, 2 to 6 percent slopes, and it has a thinner surface layer. The surface layer in most places is reddish-brown fine sandy loam that is 3 to 5 inches thick.

In many small areas this soil is severely eroded and has a surface layer of red clay loam. There are a few gullies, and some of them are deep. In some places the soil has a fairly high content of mica. There are rock outcrops in a few places, and in a few areas stones or pebbles interfere with tillage.

Mapped with this soil are a few areas of a soil that has a profile similar to that of the Cecil fine sandy loam described. The included soil is on foot slopes and colluvial fans, however, and is underlain by old local alluvium. Areas of this included soil are too small to be mapped separately.

Cecil fine sandy loam, 10 to 15 percent slopes, eroded, is suited to row crops, small grains, hay, and pasture, but, if it is cultivated, intensive practices are required to control further erosion. All of this soil has been cleared at some time, but some of it has now reseeded to shortleaf or Virginia pines. (Capability unit IVe–1; woodland group 4B)

Cecil sandy loam, 2 to 6 percent slopes (CmB).—This soil is coarser textured and has a thicker surface layer than Cecil fine sandy loam, 2 to 6 percent slopes, and in some places its B horizon is less red. The surface layer is 7 to 15 inches thick. This soil is in all parts of the county where other Cecil soils occur, but the largest areas are near Amity.

In places this soil has a fairly high content of mica. In a few small areas, stones or pebbles interfere with tillage. In a few small areas, the slope is less than 2 percent.

This soil is suited to row crops, small grains, hay, and pasture, and it is also suited to trees. Erosion is not a serious problem, but practices should be applied to help protect the soil. Much of the acreage is in forest consisting of old growth or of areas that have been cut over, but some areas are cultivated or in pasture. (Capability unit IIe–1; woodland group 4A)

Cecil sandy loam, 2 to 6 percent slopes, eroded (CmB2).—This soil has a thinner surface layer and is coarser textured than Cecil fine sandy loam, 2 to 6 percent slopes. In most places the surface layer is light-brown sandy loam that is 3 to 7 inches thick.

Many small areas of this soil are severely eroded, and in these areas the surface layer is red clay loam or sandy clay loam. There are a few gullies, and some of them are deep. In some places the soil has a fairly high content of mica. There are enough stones or pebbles to interfere with tillage in a few small areas.

This soil is suited to row crops, small grains, hay, and pasture, and it is also suited to trees. Most of it is cultivated or in pasture, but some of it has good stands of shortleaf or Virginia pines. If this soil is cultivated, practices ought to be applied to control further erosion. (Capability unit IIe–1; woodland group 4B)

Cecil sandy loam, 6 to 10 percent slopes (CmC).—This soil is on rolling ridges or on the gently rolling side slopes. It is coarser textured than Cecil fine sandy loam, 2 to 6 percent slopes.

In some places this soil has a fairly high content of mica. There are enough stones or pebbles to interfere with tillage in a few small areas.

This soil is suited to row crops, small grains, hay, and pasture, and it is also suited to trees. Much of the acreage is in forests consisting of old growth, or the areas have been cut over; but some of it is cultivated or in pasture. If it is cultivated, intensive practices are required to protect this soil from erosion. (Capability unit IIIe–1; woodland group 4A)

Cecil sandy loam, 6 to 10 percent slopes, eroded (CmC2).—This soil is coarser textured than Cecil fine sandy loam, 2 to 6 percent slopes. The surface layer in most places is light-brown sandy loam and is 3 to 6 inches thick.

In many small areas this soil is severely eroded and has a surface layer of red clay loam or sandy clay loam. There are a few gullies, and some of them are deep. In some places the soil has a fairly high content of mica. There are stones or pebbles in a few small areas that interfere with tillage.

This soil is suited to row crops, small grains, hay, and pasture, and it is also suited to trees. Much of the acreage is cultivated or in pasture, but some of it has good stands of shortleaf or Virginia pines. If it is cultivated, intensive practices are required to protect this soil from further erosion. (Capability unit IIIe–1; woodland group 4B)

Cecil sandy loam, 10 to 15 percent slopes (CmD).—This soil is generally on side slopes that border drainageways. It is coarser textured than Cecil fine sandy loam, 2 to 6 percent slopes, and it is shallower over bedrock.

In places this soil has a fairly high content of mica. There are rock outcrops in a few places, and in a few small areas there are stones or pebbles that interfere with tillage.

In some places this soil has been cleared and is suited to row crops, small grains, hay, and pasture. In other places it has good stands of shortleaf and Virginia pines and of hardwoods of low quality. If this soil is cultivated, intensive practices are required to help protect it from erosion. (Capability unit IVe–1; woodland group 4A)

Cecil sandy loam, 10 to 15 percent slopes, eroded (CmD2).—Most of this soil is on side slopes that border drainageways. It is shallower over bedrock than Cecil fine sandy loam, 2 to 6 percent slopes, and it has a thinner, coarser textured surface layer. The surface layer in most places is light-brown sandy loam that is 3 to 5 inches thick.

In many small areas this soil is severely eroded and has a surface layer of red clay loam or sandy clay loam. There are a few gullies, and some of them are deep. In some places the soil has a fairly high content of mica. In a few areas there are stones or pebbles that interfere with tillage, and there are some rock outcrops.

This soil is suited to row crops, small grains, hay, and pasture, and it is also suited to trees. All of it has been cleared, but some of it has reseeded to shortleaf or Virginia pines. If this soil is cultivated, intensive practices should be applied to help control further erosion. (Capability unit IVe–1; woodland group 4B)

Cecil soils, 15 to 25 percent slopes (CsE).—The soils in this unit are generally on side slopes that border deeply cut drainageways. They are shallower over bedrock than Cecil fine sandy loam, 2 to 6 percent slopes, and their profile is not so well developed. Their surface layer is fine sandy loam in some areas and sandy loam in others. In only a few places are the soils more than 36 inches thick.

In some places the soils in this unit have a fairly high content of mica. The bedrock outcrops in places, and there are pebbles and stones in small areas.

In some places the soils have a good stand of pine and of hardwoods of low quality, and in other places there are almost pure stands of shortleaf and Virginia pines. In areas that have been cleared, the soils are probably best used for pasture or hay. The soils are not suited to row crops, because of their steep slopes and susceptibility to erosion. (Capability unit VIe–1; woodland group 4A)

Cecil soils, 15 to 25 percent slopes, eroded (CsE2).—The soils in this unit are generally on side slopes that border deeply cut drainageways. They are shallower over bedrock than Cecil fine sandy loam, 2 to 6 percent slopes, have a thinner surface layer, and have a profile that is not so well developed. The surface layer in most places is light-brown sandy loam or fine sandy loam that is 3 to 5 inches thick.

In many small areas the soils are severely eroded and have a surface layer of red clay loam or sandy clay loam. There are a few gullies, and some of them are deep. In some places the soils have a fairly high content of mica. Bedrock outcrops in places, and small areas contain pebbles or stones.

In all of this mapping unit, the trees have been cleared, but some of the areas have reseeded to shortleaf or Virginia pines. The soils are not suited to row crops, because they are highly susceptible to erosion. They can be used for pasture, hay, or trees. (Capability unit VIe–1; woodland group 4B)

Cecil soils, 25 to 45 percent slopes (CsF).—The soils in this unit are mainly in areas that border the major drainageways, but they are also in other steep areas. The soils are shallower over bedrock than Cecil fine sandy loam, 2 to 6 percent slopes, and their profile is not so well developed. The surface layer is fine sandy loam in some places and sandy loam in others. Depth to bedrock is generally no more than 36 inches.

In some places these soils have a fairly high content of mica. In places bedrock outcrops, and in some areas the soils contain gravel and stones.

These soils are probably best used to grow trees. They support fair stands of shortleaf pine, Virginia pine, and mature hardwoods. (Capability unit VIIe–1; woodland group 4A)

Cecil soils, 25 to 45 percent slopes, eroded (CsF2).—The soils in this unit are on steep side slopes that border the major drainageways and in other steep areas. They are shallower over bedrock than Cecil fine sandy loam, 2 to 6 percent slopes, their profile is not so well developed, and they have a thinner surface layer. In most places their surface layer is light-brown fine sandy loam or sandy loam that is 3 to 5 inches thick.

In some places these soils have a fairly high content of mica. Bedrock outcrops in places, and in some places the soils contain gravel or stones.

These soils are better suited to trees than to other uses. Some of the acreage is in pasture, some is idle, and some has reseeded to shortleaf or Virginia pines. (Capability unit VIIe–1; woodland group 4B)

Cecil gravelly fine sandy loam, 2 to 6 percent slopes (CgB).—This well-drained soil is on ridges in the uplands, mostly in the northwestern part of the county, but there are small areas in all parts. It has a surface layer of brown to grayish-brown, friable gravelly fine sandy loam. The subsoil is red, friable or firm clay.

The following describes a representative profile in a cutover forest, 0.5 mile west of Pisgah Church on a gravel road, 160 feet north of the road:

A_p—0 to 7 inches, yellowish-brown (10YR 5/6) gravelly fine sandy loam; weak, coarse, granular structure; friable; abundant grass and tree roots; many quartz pebbles as much as 3 inches in diameter; 1 percent of coarse fragments are more than 3 inches in diameter; medium acid; clear, smooth boundary.

B_1—7 to 11 inches, red (2.5YR 4/8) clay loam; weak, medium, subangular blocky structure; friable; plentiful tree roots; distinct, discontinuous clay films; strongly acid; clear, smooth boundary.

B_2—11 to 32 inches, red (2.5YR 4/8) clay; moderate, medium, subangular blocky structure; friable or firm; distinct, continuous clay films; a few, finely divided mica flakes; strongly acid; clear, wavy boundary.

B_{31}—32 to 36 inches, red (2.5YR 4/6) clay loam; weak, medium, subangular blocky structure; friable; distinct, discontinuous clay films; a few, small tree roots; common, finely divided mica flakes; strongly acid; clear, wavy boundary.

B_{32}—36 to 43 inches, red (2.5YR 4/6) clay loam; weak, medium, subangular blocky structure to massive; friable; common, finely divided mica flakes; a few, fine tree roots; strongly acid; clear, wavy boundary.

C—43 to 48 inches +, red clay loam and decomposed schist; massive.

The profile of this soil is similar to that of Cecil fine sandy loam, 2 to 6 percent slopes, but 20 percent or more of the surface layer consists of quartz and schist gravel. The surface layer is 6 to 9 inches thick. In a few small areas the slope is less than 2 percent.

This soil is suited to row crops, small grains, hay, and pasture, and it is also suited to trees. Much of the acreage is in forests consisting of old growth or of areas that have been cut over, but some is cultivated or is in pasture. Erosion is not a serious problem, but the gravel in the soil interferes with tillage. If this soil is cultivated, practices should be applied to help protect it from erosion. (Capability unit IIe–1; woodland group 4A)

Cecil gravelly fine sandy loam, 2 to 6 percent slopes, eroded (CgB2).—This soil is on ridges, mainly in the northwestern part of the county, but a small acreage is in other areas. The soil has a thinner surface layer than Cecil gravelly fine sandy loam, 2 to 6 percent slopes. The surface layer in most places is reddish-brown gravelly fine sandy loam that is 3 to 7 inches thick.

In many small areas this soil is severely eroded and the surface layer is red clay loam. There are a few gullies, and some of them are deep.

Even though the gravel interferes with tillage, this soil is suited to row crops, small grains, hay, and pasture, and it is also suited to trees. Most of the acreage is cultivated or in pasture, but some of it has good stands of shortleaf or Virginia pines. If this soil is cultivated, practices ought to be applied to help control further erosion. (Capability unit IIe–1; woodland group 4B)

Cecil gravelly fine sandy loam, 6 to 10 percent slopes (CgC).—This soil is on rolling ridges or on gently rolling side slopes. Small areas are in all parts of the county where other Cecil soils occur, but this soil is mostly in the northwestern part.

Even though the gravel in the soil interferes with tillage, this soil is suited to row crops and small grains, and it is also suited to hay, pasture, and trees. Much of the acreage is in forest consisting of old growth or of areas that have been cut over, but some of the acreage is cultivated or in pasture. If this soil is cultivated, intensive practices are required to protect it from erosion. (Capability unit IIIe–1; woodland group 4A)

Cecil gravelly fine sandy loam, 6 to 10 percent slopes, eroded (CgC2).—This soil is mostly on side slopes in the northwestern part of the county, but small areas are in other parts where there are Cecil soils. The soil has a thinner surface layer than Cecil gravelly fine sandy loam, 2 to 6 percent slopes. The surface layer in most places is reddish-brown gravelly fine sandy loam that is 3 to 5 inches thick.

In many small areas this soil is severely eroded and has a surface layer of red clay loam. There are a few gullies, and some of them are deep.

This soil is suited to row crops, small grains, hay, and pasture, and it is also suited to trees. Much of the acreage is cultivated or in pasture, but some of it has good stands of shortleaf and Virginia pines. The gravel in the soil interferes with tillage. Also, when the soil is cultivated, intensive practices are required to protect it from further erosion. (Capability unit IIIe–1; woodland group 4B)

Cecil gravelly fine sandy loam, 10 to 15 percent slopes (CgD).—This soil occurs throughout the county in small areas near other Cecil soils. Most of it, however, is on side slopes that border drainageways in the northwestern part of the county. In places there are rock outcrops and loose stones within the areas.

In some places this soil has been cleared. Where it has been cleared, the soil is suited to row crops, small grains, hay, and pasture and it is also suited to trees. In other places this soil has good stands of shortleaf and Virginia pines and of hardwoods of low quality. The gravel in the soil interferes with tillage. If the soil is cultivated, intensive practices are required to protect it from erosion. (Capability unit IVe–1; woodland group 4A)

Cecil gravelly fine sandy loam, 10 to 15 percent slopes, eroded (CgD2).—This soil generally is on side slopes that border drainageways in the northwestern part of the county, but it is also in small areas where other Cecil soils occur. This soil is shallower over bedrock than Cecil gravelly fine sandy loam, 2 to 6 percent slopes, and it has a thinner surface layer. The surface layer in most places is reddish-brown gravelly fine sandy loam that is 3 to 5 inches thick.

In many small areas this soil is severely eroded and has a surface layer of red clay loam. There are a few gullies, and some of them are deep. In places there are rock outcrops and loose stones within the areas.

This soil is suited to row crops, small grains, hay, and pasture crops, and it is also suited to trees. All of the acreage has been cleared, but some of it has reseeded to shortleaf and Virginia pines. The gravel in the soil interferes with tillage. The soil requires intensive practices for control of further erosion if it is cultivated. (Capability unit IVe–1; woodland group 4B)

Cecil gravelly fine sandy loam, 15 to 25 percent slopes (CgE).—This soil is shallower over bedrock than Cecil gravelly fine sandy loam, 2 to 6 percent slopes, and its profile is not so well developed. Depth to bedrock is generally no greater than 36 inches. In places there are rock outcrops and loose stones on this soil.

In some places this soil has good stands of shortleaf and Virginia pines and of hardwoods of low quality. In other places the areas have reseeded to almost pure stands of pine. If this soil has been cleared, it is probably best used for pasture and hay crops. This soil is not suited to row crops, because it has strong slopes and is highly susceptible to erosion. (Capability unit VIe–1; woodland group 4A)

Cecil gravelly fine sandy loam, 15 to 25 percent slopes, eroded (CgE2).—This soil is generally on side slopes that border deeply cut drainageways. It is shallower over bedrock than Cecil gravelly fine sandy loam, 2 to 6 percent slopes; its profile is not so well developed; and it has a thinner surface layer. Depth to bedrock is generally no greater than 36 inches. The surface layer in most places is reddish-brown gravelly fine sandy loam that is 3 to 5 inches thick.

In many small areas this soil is severely eroded and has a surface layer of red clay loam. There are a few gullies, and some of them are deep. In places there are rock outcrops and loose stones.

This soil is probably best used for pasture, hay, or trees (fig. 5). It is not suited to crops, because it is highly susceptible to erosion. All of this soil has been cleared, but some of it has reseeded to shortleaf and Virginia pines. (Capability unit VIe–1; woodland group 4B)

Figure 5.—**Pasture of grass and clover on Cecil gravelly fine sandy loam, 15 to 25 percent slopes, eroded.**

Cecil stony fine sandy loam, 6 to 15 percent slopes, eroded (CtD2).—This well-drained soil is on the ridge crests and side slopes of hilly uplands in the northwestern part of the county. Its A horizon is reddish-brown to very dark brown, friable stony fine sandy loam. The B horizon is red, friable clay loam or clay.

The following describes a representative profile in a forest, 1⅓ miles south of Comer's Store, ½ mile west on a private road, and 100 feet south of the road:

A_0—½ inch or less of partly decomposed and undecomposed twigs and other litter from hardwood trees.

A_1—0 to 3 inches, very dark grayish-brown (10YR 3/2) stony fine sandy loam; weak, fine, granular structure; very friable; abundant, medium and small, woody roots; stones that are as much as 8 inches long are common; strongly acid; clear, smooth boundary.

A_2—3 to 7 inches, yellowish-brown (10YR 5/4) fine sandy loam; weak, medium, granular structure; very friable; abundant, small and medium, woody roots; a few quartz pebbles that are as much as 1 inch in diameter; strongly acid; clear, smooth boundary.

B_1—7 to 9 inches, red (2.5YR 4/6) clay loam; moderate, medium and fine, subangular blocky structure; friable; thin, barely observable clay films; plentiful, small, woody roots; very strongly acid; clear, smooth boundary.

B_{21}—9 to 14 inches, red (2.5YR 4/6) clay; moderate, medium and fine, subangular blocky structure; friable; thin, distinct, continuous clay films; a few, small, woody roots; strongly acid; clear, smooth boundary.

B_{22}—14 to 26 inches, red (2.5YR 4/6) clay; moderate, medium and fine, subangular blocky structure; friable; distinct, continuous clay films; a few, small, woody roots; a few, finely divided mica flakes; strongly acid; clear, smooth boundary.

B_3—26 to 35 inches, red (2.5YR 4/8) silty clay loam; moderate, medium and fine, subangular and angular blocky structure; friable; thin, distinct, discontinuous clay films; a few finely divided mica flakes; some weathered parent material; layer extends downward to hard rock in places; medium acid; abrupt, irregular boundary.

C—35 to 37 inches, red- and yellow-streaked silt loam; massive; horizon absent in places.

D—37 inches +, bedrock.

This soil is generally shallower over bedrock than Cecil fine sandy loam, 2 to 6 percent slopes. The surface layer is also darker and contains more stones, the subsoil is more friable, and in most places the layer of disintegrated bedrock is thinner. The A horizon ranges from reddish brown to very dark grayish brown in color and from 5 to 10 inches in thickness. The B horizon is red and is 24 to 30 inches thick. The A and B horizons combined generally are no more than 36 inches thick.

In some places this soil has a fairly high content of mica. Three-fourths or more of the acreage has stones on the surface that interfere with tillage. In a few places the slope is less than 6 percent. In many small areas this soil is severely eroded and has a surface layer of red clay loam.

Cecil stony fine sandy loam, 6 to 15 percent slopes, eroded, is low in fertility, medium in organic matter, and strongly acid. Permeability is moderate, and the soil has moderate available water capacity. Crops grown on this soil respond well if lime and fertilizer are added.

This soil is suited to row crops, small grains, hay, and pasture, and it is also suited to trees. If it is cultivated, intensive practices are required to protect it from erosion.

Much of this soil is in old growth or in cutover forest, but some of the acreage is cultivated or in pasture. (Capability unit IVe–1; woodland group 4B)

Cecil stony fine sandy loam, shallow, 15 to 25 percent slopes (CuE).—This soil is on side slopes in the northwestern part of the county. It is shallower over bedrock than Cecil stony fine sandy loam, 6 to 15 percent slopes, eroded. Depth to bedrock is generally no more than 24 inches.

In some places the soil contains a large amount of mica. In a few areas it is moderately eroded.

Mapped with this soil are areas of a deep soil that is underlain by colluvium and local alluvium. Areas of this included soil are too small to be mapped separately.

In some places Cecil stony fine sandy loam, shallow, 15 to 25 percent slopes, has a good stand of hardwoods of low quality, and in other places the stands consist of shortleaf and Virginia pines. If this soil is cleared, it is best used to grow pasture crops or hay crops. (Capability unit VIe–1; woodland group 4A)

Cecil stony fine sandy loam, shallow, 25 to 55 percent slopes (CuF).—This soil is on side slopes in the northwestern part of the county. It is shallower over bedrock than Cecil stony fine sandy loam, 6 to 15 percent slopes, eroded. Depth to bedrock is generally no greater than 24 inches. In some places the soil contains large amounts of mica.

Mapped with this soil are some areas of a deep soil that is underlain by colluvium and local alluvium. Areas of the included soil are too small to be mapped separately.

Cecil stony fine sandy loam, shallow, 25 to 55 percent slopes, is best used for trees. It is suited to pines and hardwoods. (Capability unit VIIe–1; woodland group 4A)

Cecil clay loam, 6 to 10 percent slopes, severely eroded (CcC3).—This soil is finer textured than Cecil fine sandy loam, 2 to 6 percent slopes, and it has a thinner surface layer. Also, the profile is generally shallower over bedrock. The surface layer is 4 to 6 inches thick and consists of red clay loam that is mostly material from the former subsoil that has been mixed with material from the original surface layer. In places as much as one-fourth of an area is made up of shallow gullies.

The following describes a representative profile in a field where the soils are idle, 0.3 mile northeast of Shiloh Church, 0.3 mile east along a private road, and 500 yards south:

A_p—0 to 4 inches, red (2.5YR 4/8) clay loam; moderate, medium, granular structure; friable when moist, hard when dry; abundant, fibrous roots; medium acid; clear, smooth boundary.

B_2—4 to 19 inches, red (2.5YR 4/6) clay; strong, medium, subangular blocky structure; firm; distinct, discontinuous clay films; plentiful, fibrous roots; a few grains of quartz; a few fine mica flakes; strongly acid; clear, smooth boundary.

B_3—19 to 29 inches, red (2.5YR 4/6) clay; common, fine, distinct mottles of reddish yellow (7.5YR 6/8); moderate, medium and coarse, subangular blocky structure; firm; distinct, discontinuous clay films; a few, coarse mica flakes; a few quartz pebbles as much as one-fourth inch in diameter; strongly acid; gradual, smooth boundary.

C—29 to 35 inches +, red, weathered gneiss that is streaked with yellow.

Cecil clay loam, 6 to 10 percent slopes, severely eroded, has poorer tilth than Cecil fine sandy loam, 2 to 6 percent slopes. It is also more droughty and takes in water more slowly. This soil can be worked within only a narrow range of moisture content. Because of the fine texture of the surface layer, the surface soil puddles and crusts after a hard rain. Therefore, it is difficult to obtain a good stand of crops.

This soil is suited to small grains and to hay and pasture. It can be used for row crops if intensive practices are used to control further erosion.

Much of the acreage has a cover of broomsedge, briers, and honeysuckle, and there is a scattering of pines. Some of the acreage is still cultivated, even though the soil is difficult to till. (Capability unit IVe–2; woodland group 4C)

Cecil clay loam, 2 to 6 percent slopes, severely eroded (CcB3).—This soil is in all parts of the county near other Cecil soils. It is similar to Cecil clay loam, 6 to 10 percent slopes, severely eroded, but it has fewer gullies.

This soil can be worked within only a narrow range of moisture content. Because of the fine texture of the surface layer, the surface of the soil puddles and crusts after a hard rain and takes in water slowly. Therefore, it is hard to obtain a good stand of crops.

Row crops, small grains, hay, and pasture make fair yields on this soil. Intensive practices are required, however, to help control further erosion.

Much of the acreage has a cover of broomsedge, briers, and honeysuckle, and there is a scattering of pines. Some areas have reseeded to almost pure stands of Virginia pine. Part of the acreage is still cultivated, even though the soil is difficult to till. (Capability unit IIIe–2; woodland group 4C)

Cecil clay loam, 10 to 15 percent slopes, severely eroded (CcD3).—This soil is in all parts of the county near other Cecil soils. It has stronger slopes than Cecil clay loam, 6 to 10 percent slopes, severely eroded, but its profile is similar. In some places this soil has a fairly high content of mica.

This soil is generally not suited to cultivated crops. It is difficult to till because it can be worked within only a narrow range of moisture content. Because of the fine texture of the surface layer, the surface of the soil puddles and crusts after a hard rain. As a result, the soil takes in water slowly. Therefore, it is hard to obtain a good stand of crops, although pasture and hay crops produce fair yields. Most of this soil is idle or in almost pure stands of Virginia pine. (Capability unit VIe–2; woodland group 4C)

Cecil clay loam, 15 to 25 percent slopes, severely eroded (CcE3).—This soil is in all parts of the county near other Cecil soils. It is shallower over bedrock than Cecil clay loam, 6 to 10 percent slopes, severely eroded. In most places depth to bedrock is less than 24 inches. In some places the soil has a fairly high content of mica.

This soil is too steep and eroded for cultivated crops, and it is also too steep for hay or pasture. Most of the acreage is idle or in stands of Virginia pine. The pines make poor yields, but, once they are established, they help prevent further erosion. (Capability unit VIIe–2; woodland group 4C)

Chewacla Series

The Chewacla series consists of deep, nearly level to gently sloping soils that are somewhat poorly drained. These soils are on the flood plains of the major streams and of smaller streams in the county. The surface layer commonly is reddish-brown, friable silt loam or fine sandy loam. The material below the surface layer is stratified in most places, but in a few places it shows evidence of profile development. Gray mottling, and in places yellowish-brown or brown mottling, occurs at a depth between 13 and 24 inches. The parent material is recent alluvial deposits.

These soils are near the Congaree and Wehadkee soils. They are not so well drained as the Congaree soils, but they are better drained and have a brighter color than the Wehadkee soils.

The Chewacla soils are important for agriculture, although they are medium to low in fertility, medium in content of organic matter, and medium acid to strongly acid. Their available water capacity is high, and permeability is moderately rapid. The soils are subject to frequent flooding, but they have good tilth and can be worked within a wide range of moisture content. They are suited to corn, hay, and pasture, but in places tile drains or open ditches are needed for crops that require good drainage. Crops grown on these soils respond well if lime and fertilizer are added.

Chewacla soils (Cw).—The Chewacla soils in this county are mapped as one unit. The soils are nearly level and somewhat poorly drained. They occupy large areas on the first bottoms of large streams and are on most of the flood plains of the smaller streams. Their A horizon is light-brown to dark reddish-brown, friable silt loam or fine sandy loam. It is underlain by a C horizon of friable silt loam to loamy fine sand.

The following describes a representative profile in a pasture, 440 yards east of Bell Road, 30 yards south of Fourth Creek:

A_p—0 to 6 inches, reddish-brown (5YR 4/4) silt loam; weak, fine, granular structure; friable; abundant, small, fibrous roots; slightly acid; abrupt, wavy boundary.

C_1—6 to 8 inches, dark-brown (7.5YR 4/4) loamy fine sand; single grain; loose; plentiful small, fibrous roots; a few, fine mica flakes; slightly acid; abrupt, wavy boundary.

C_2—8 to 13 inches, reddish-brown (5YR 4/4) silt loam; a few, medium, distinct mottles of brown (7YR 5/2); weak, medium, granular structure; friable; plentiful, small, fibrous roots; thin, black layers probably made up of decomposed leaves; medium acid; clear, smooth boundary.

C_3—13 to 36 inches, mottled light-gray (10YR 7/2), dark yellowish-brown (10YR 4/4), and reddish-brown (5YR 4/4) silt loam; weak, medium, granular structure; friable; a few, small, fibrous roots in upper 24 inches of the horizon; medium acid.

The A horizon ranges from light brown to dark reddish brown in color and from 6 to 14 inches in thickness. The C horizon is commonly reddish-brown, stratified silt loam to loamy fine sand and is mottled with gray. In some places, however, it is yellowish brown or brown at a depth between 13 and 24 inches. Depth to the water table varies greatly with the season.

The soils in this unit are generally subject to frequent flooding. They are medium to low in fertility, medium in content of organic matter, and medium acid to strongly acid. Their available water capacity is high, and permeability is moderate. These soils are easy to till and can be tilled within a wide range of moisture content. Crops grown on them respond well if lime and fertilizer are added.

The Chewacla soils are suited to corn, hay, and pasture. Most of the acreage is cultivated or in pasture, but in some places there is a cover of alders, briers, and bog rush. (Capability unit IIIw-1; woodland group 1)

Colfax Series

The Colfax series is made up of deep, gently sloping, somewhat poorly drained soils of the uplands. The soils have a surface layer of light-gray, light olive-brown, and light yellowish-brown, friable sandy loam that is generally 6 to 15 inches thick. Their subsoil is yellowish-brown to

pale-yellow, firm or friable sandy clay, silty clay, or clay that is mottled with gray and yellowish red. The subsoil is about 20 to 32 inches thick. Mottling generally is at a depth between 12 and 24 inches, but in places it is at a depth between 12 and 30 inches. The lower part of the subsoil is more grayish than the upper part. Below the subsoil is material weathered from acid rock or local alluvium washed from the surrounding soils.

These soils are mostly near the Appling and Mayodan soils. They are also near other soils of the uplands, and they generally receive seepage or drainage water from them. As a result, they are not so well drained as the other soils of the uplands and they have a more grayish color. The Colfax soils are similar to the Worsham soils, but they are better drained than those soils and their profile is not so gray.

These soils are medium to low in fertility and are medium in organic matter. They are medium acid to strongly acid. Their available water capacity is moderate, and the soils are moderately permeable. Crops grown on them respond well if lime and fertilizer are added.

The Colfax soils are suited to corn, soybeans, lespedeza, and pasture. Because their acreage is small and they are suited to only a few different crops, these soils are not important to the agriculture of the county.

Colfax sandy loam, 2 to 6 percent slopes (CxB).—This somewhat poorly drained soil of the uplands is in all parts of the county. The areas are small and are around the heads of springs, at the base of slopes, or in drainageways. The A horizon is light-gray, light olive-brown, and light yellowish-brown, friable sandy loam. The B horizon is yellowish-brown to pale-yellow, firm or friable sandy clay, silty clay, or clay that is mottled with gray and yellowish red.

The following describes a representative profile in a forest of hardwoods and pines, 0.35 mile east of E. R. McNeely's store on a paved road, then 0.2 mile south on a gravel road, and 0.3 mile south of a farmhouse:

A_{00}—2½ to 1½ inches of litter from hardwoods and pines.

A_0—1½ inches or less of decomposed and partly decomposed, dark-gray organic material.

A_1—0 to 6 inches, light olive-brown (2.5Y 5/4) sandy loam; weak, coarse and very coarse, granular structure; very friable; plentiful, small and medium, woody roots; medium acid to strongly acid; clear, smooth boundary.

A_3—6 to 11 inches, light yellowish-brown (2.5Y 5/4) sandy loam; a few, fine, faint mottles of olive yellow (2.5Y 6/6); weak, coarse and very coarse, granular structure; very friable; plentiful, small and medium, woody roots; strongly acid; clear, smooth boundary.

B_1—11 to 15 inches, olive-yellow (2.5Y 6/6) sandy clay loam; common, fine, prominent mottles of reddish yellow (7.5YR 6/8) and a few, fine, faint to distinct mottles of light gray (2.5Y 7/2); weak, medium, subangular blocky structure; friable; a few, small and medium, woody roots; strongly acid; clear, smooth boundary.

B_2—15 to 20 inches, olive-yellow (2.5Y 6/6) clay loam; common, medium, prominent mottles of yellowish brown (10YR 5/8) and a few, medium, faint to distinct mottles of light gray (2.5Y 7/2); moderate, fine and medium, angular and subangular blocky structure; friable; thin, distinct, discontinuous clay films; a few, small, woody roots; strongly acid; clear, wavy boundary.

B_3—20 to 24 inches, mottled yellowish-brown (10YR 5/8), olive-yellow (2.5Y 6/6), and light-gray (2.5Y 7/2) sandy clay loam that contains pockets of sandy loam; moderate, medium, angular blocky structure; friable; a few, thin, discontinuous clay films; a few, small, woody roots; strongly acid; clear, irregular boundary.

C—24 to 42 inches +, light-gray sandy clay; common, coarse, prominent mottles of yellowish red and common, coarse, prominent mottles of olive yellow; massive to weak, coarse, angular blocky structure; friable; a few, thin clay films; a few, small, woody roots; strongly acid.

The A horizon ranges from light gray to light olive brown or yellowish brown in color and is 6 to 15 inches thick. The B horizon is commonly yellowish brown to pale yellow and is mottled with gray and yellowish red. It is 12 to 32 inches thick. In places the B_3 horizon is absent. Mottling is generally at a depth between 12 and 24 inches. The lower part of the B horizon is grayer than the upper part. In some areas the slope is less than 2 percent, and in some places it is more than 6 percent.

Mapped with this soil are some areas of a soil that has a surface layer of dark-gray to dark-brown, friable fine sandy loam and a B horizon of yellowish-brown, firm clay that is mottled with gray and olive. Also mapped with this soil are some areas of a soil that has a surface layer of dark-gray to dark-brown loam or silt loam. Its subsoil, however, is similar in color and texture to the subsoil of the profile described. A few areas of a soil that has a profile similar to the one described, but that is on terraces, are also included. Areas of these included soils are too small to be mapped separately.

Colfax sandy loam, 2 to 6 percent slopes, is medium to low in fertility, medium in content of organic matter, and medium acid to strongly acid. It has moderate available water capacity and is moderately permeable. Crops grown on this soil respond well if lime and fertilizer are added.

This soil is suited to corn, soybeans, and lespedeza. Some of the areas are cultivated or in pasture. Other areas are in hardwood forests, but the trees generally do not reach the maximum size. Still other areas are idle or have a cover of broomsedge, bog rush, and briers. (Capability unit IIIw 2; woodland group 3A)

Congaree Series

The Congaree series consists of deep, nearly level, well-drained soils of first bottoms. The soils generally are along large streams, but some are along the smaller streams. They have a surface layer of dark-brown, friable fine sandy loam to loam. The material below the surface layer is stratified in most places, but in a few areas it shows evidence of profile development. The parent material is recent deposits of alluvial material. A profile of a Congaree soil is shown in figure 6.

These soils are near the Chewacla and Buncombe soils, but they are better drained than the Chewacla soils. They are less sandy than the Buncombe soils, and they have less rapid permeability.

The Congaree soils are medium in fertility and in content of organic matter, and they are medium acid. Their available water capacity is high, and permeability is moderately rapid. These soils are subject to frequent flooding. They are easy to till and can be tilled within a wide range of moisture content. Crops grown on them respond well if lime and fertilizer are added.

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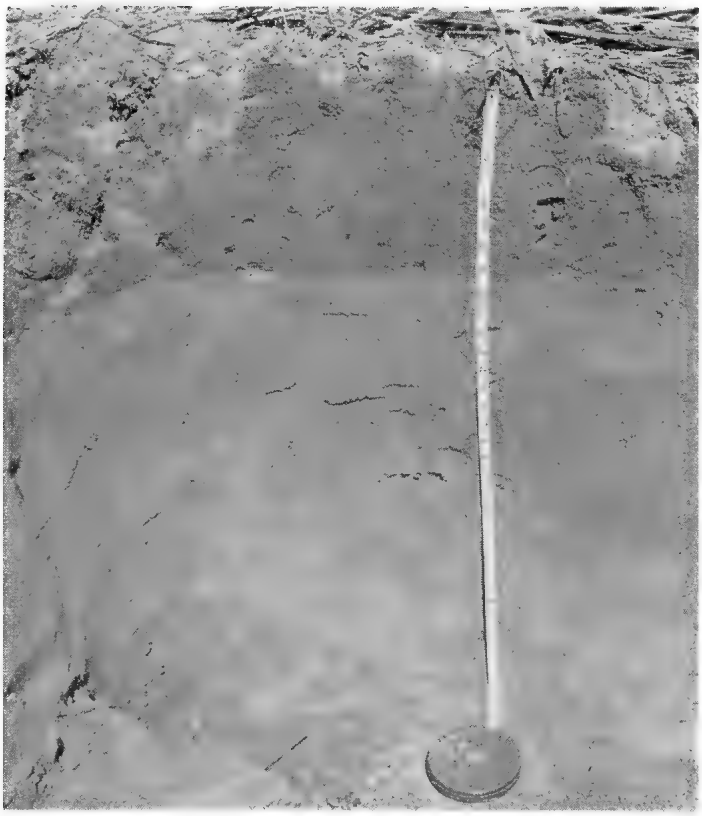

Figure 6.—**Profile of a Congaree soil along Rock Creek south of Union Grove; the tape measure shows a depth of 3½ feet.**

The Congaree soils are suited to most row crops and to pasture and hay. A greater number of different crops can be grown on them than on the other soils of first bottoms.

Congaree soils (Cy).—These are the only Congaree soils mapped in this county. The soils are well drained and are nearly level. They are on first bottoms, generally along large streams, but some are along the smaller streams. The A horizon of these soils is yellowish-brown to dark-brown, very friable fine sandy loam to loam. The soil material underlying the A horizon is dark yellowish-brown to yellowish-brown, friable fine sandy loam to silt loam.

The following describes a representative profile in a cultivated field, 1½ miles south of Central School on a paved road, 130 yards west of the road and south of Snow Creek:

A_p—0 to 7 inches, dark-brown (10YR 4/3) fine sandy loam; weak, medium, granular structure; very friable; a few, small, fibrous roots, and a few, medium roots of trumpetvines; common, finely divided mica flakes; medium acid; abrupt, wavy boundary.

C_1—7 to 11 inches, dark-brown (7.5YR 4/4) very fine sandy loam to silt loam; weak, fine and medium, granular structure; friable; a few, small, fibrous roots, and a few, medium roots of trumpetvines; a few, small, water-rounded pebbles that are 2 to 3 millimeters in diameter; common, finely divided mica flakes; medium acid; clear, wavy boundary.

C_2—11 to 18 inches, dark yellowish-brown (10YR 4/4) fine sandy loam; weak, medium, granular structure; very friable; a few, small, fibrous roots, and a few, medium roots of trumpetvines; a few water-rounded pebbles that are 2 to 3 millimeters in diameter; slightly acid; abrupt, wavy boundary.

C_3—18 to 32 inches, dark yellowish-brown (10YR 4/4) very fine sandy loam or silt loam; weak, medium, granular structure; very friable; a few, small, fibrous roots, and a few, medium roots of trumpetvines; common, finely divided mica flakes; pockets of sand or loamy sand that are as much as 15 millimeters along the longest axis and are parallel to the surface; medium acid; clear, wavy boundary.

C_4—32 to 48 inches +, stratified, dark-brown, strong-brown, and yellowish-brown layers of sand, silt, silt loam, very fine sandy loam, and fine sandy loam; massive; friable; common, finely divided mica flakes.

The A horizon ranges from yellowish brown to dark brown in color, and it is 6 to 15 inches thick. The C horizon commonly ranges from dark yellowish-brown fine sandy loam to silt loam, and it is 20 to 30 inches or more thick.

These soils are medium in fertility and in organic matter. They are medium acid and have high available water capacity and moderately rapid permeability. They are subject to frequent overflow. Crops grown on them respond well if lime and fertilizer are added. The soils are easy to till and can be tilled within a wide range of moisture content.

The Congaree soils are suited to most row crops and to pasture and hay. They are suited to a wider range of crops than the other soils of the first bottoms. Most of the acreage is cultivated or in pasture, but some of it is in pines. (Capability unit IIw–1; woodland group 1)

Davidson Series

The Davidson series is made up of gently sloping to strongly sloping, well-drained soils of the uplands. In the less eroded areas, the surface layer is dark reddish-brown to dark-brown clay loam and the subsoil is dark-red to dusky-red, firm clay. The bedrock consists chiefly of diorite and gabbro, but it also includes some hornblende gneiss. Depth to bedrock in most places is more than 6 feet, but in many places it is more than 20 feet.

These soils are near the Lloyd, Mecklenburg, and Hiwassee soils. They are generally deeper than the Lloyd soils, their surface layer contains less sand, and their subsoil is darker red. They are deeper than the Mecklenburg soils, their surface layer is darker and contains less sand, and their subsoil is a darker red clay. Their surface layer is also darker and contains less sand than that of the Hiwassee soils, which developed in soil material that was transported by streams.

The Davidson soils are moderately fertile, low in organic matter, and medium acid to slightly acid. They have moderate available water capacity and moderate permeability. Crops grown on them respond well if lime and fertilizer are added.

These soils occupy large areas in the central and southeastern parts of the county, and a few small areas are in other parts of the county. The soils are suited to many different crops. They are important for agriculture, and much of the acreage is cultivated or is used for pasture.

Davidson clay loam, 2 to 6 percent slopes, eroded (DaB2).—This soil is generally on broad crests of ridges in the uplands in the southeastern part of the county, but

there are small areas in other parts. It is well drained and has an A horizon of dark reddish-brown to dark-brown clay loam. The B horizon is dark-red to dusky-red, firm clay.

The following describes a representative profile in a cultivated field on the Morrison farm, 1.4 miles east of Scotts-Rosenwald School and 75 yards north of the road:

A_p—0 to 6 inches, dark-red (10R 3/6) clay loam; moderate, medium, granular structure; friable; sticky when wet; plentiful, fibrous roots; slightly acid; clear, smooth boundary.

B_{21}—6 to 50 inches, dark-red (10R 3/6) clay; moderate, medium to fine, subangular blocky structure; firm; plentiful, fibrous roots in the upper 9 inches of the horizon; a few, fibrous roots and old, woody root channels that extend to a depth of 23 inches; distinct, continuous clay films; a few, angular grains of quartz sand; medium acid; gradual, smooth boundary.

B_{22}—50 to 70 inches, dark-red (10R 3/6) clay; moderate, medium, subangular blocky structure; firm; distinct, discontinuous clay films; common, angular grains of quartz sand; medium acid; gradual, smooth boundary.

B_{31}—70 to 84 inches, dark-red (10R 3/6) clay loam; weak, medium, subangular blocky structure; friable; common grains of quartz that are as much as 4 millimeters in diameter; clay films lie adjacent to the grains of quartz; a few, finely divided mica flakes; medium acid; gradual, smooth boundary.

B_{32}—84 to 92 inches, dark-red (10R 3/6) clay loam; massive; friable; a few finely divided mica flakes; a few grains that appear to be primary minerals; a few, fine grains of quartz; medium acid; gradual, smooth boundary.

C—92 to 112 inches +, mixture of dark-red clay, mica, quartz, and primary minerals; massive.

The A horizon ranges from dark reddish brown to dark brown in color and from 3 to 8 inches in thickness. The B horizon is dark red to dusky red and is 36 to 96 inches thick. The A and B horizons combined are thicker than 36 inches.

In some eroded places clay from the former subsoil has been mixed with the remaining original surface layer by tillage. In some areas the slope is less than 2 percent.

This soil is moderately fertile, low in organic matter, and medium acid. The available water capacity and permeability are moderate. Crops grown on this soil respond well if lime and fertilizer are added.

This soil is suited to corn, small grains, and pasture, and it is also suited to trees. It is one of the best soils for alfalfa and forage crops in the county. Much of the acreage is cultivated or is used for pasture, but some is in forest consisting of old growth or of areas that have been cut over. If this soil is cultivated, practices are needed to prevent further erosior. (Capability unit IIe–2; woodland group 4B)

Davidson clay loam, 6 to 10 percent slopes, eroded (DaC2).—This soil is on side slopes in all parts of the county where other Davidson soils occur. In most places its surface layer is dark-red clay loam and is 3 to 6 inches thick. In some areas clay from the former subsoil has been mixed with the original surface layer by tillage. Erosion ranges from moderate to severe.

This soil is well suited to corn, small grains, hay, and pasture, and it is also suited to trees. It is one of the best soils in the county for alfalfa and forage crops. Much of the acreage is cultivated or is used for pasture, but some of it has good stands of shortleaf and Virginia pines. Because of the strong slopes and hazard of erosion, intensive practices are required to protect this soil when it is cultivated. (Capability unit IIIe–2; woodland group 4B)

Hiwassee Series

The Hiwassee series consists of deep, gently sloping to strongly sloping, well-drained soils of terraces that are along the major streams in the county. The surface layer is dark reddish-brown loam and is 4 to 10 inches thick. The subsoil is red to dark-red clay and is more than 36 inches thick. In many places there is a layer of rounded stones just below the subsoil. The parent material is old alluvium.

These soils are near the Wickham and Altavista soils. They are generally deeper than the Wickham soils. Their surface layer is also darker colored and finer textured, and their subsoil is darker red. Their surface layer is browner and finer textured than that of the Altavista soils, and their subsoil is redder and better drained.

The Hiwassee soils are medium in natural fertility. They are low in organic matter and are medium acid. Their available water capacity and permeability are moderate.

These soils are suited to many different crops. They are good for agriculture, but they are of only minor importance because of their small acreage. Most of the acreage is cultivated or is used for pasture, but some is in trees.

Hiwassee loam, 2 to 6 percent slopes, eroded (HwB2).—This deep, well-drained soil is on high terraces along the major streams in the county. It has an A horizon of dark-brown to dark reddish-brown, friable loam. Its B horizon is dark-red, firm clay.

The following describes a representative profile in a grove of Virginia pines near Lookout Shoals Reservoir:

A_{00}—1½ inches of pine litter.

A_0—½ inch or less of very dark gray, decomposed organic material.

A_p—0 to 6 inches, dark reddish-brown (2.5YR 3/4) loam; weak, coarse, granular structure; friable; plentiful, small and medium, woody roots; a few water-rounded pebbles; strongly acid; abrupt, wavy boundary.

B_1 6 to 10 inches, dark-red (2.5YR 3/6) clay loam; weak, medium, subangular blocky structure; friable; a few, thin clay films; plentiful, small and medium, woody roots; a few, small, water-rounded pebbles that are less than 10 millimeters in diameter; strongly acid; clear, wavy boundary.

B_{21}—10 to 20 inches, dark-red (10R 3/6) clay; moderate, medium, subangular blocky structure; firm; thin, distinct, discontinuous clay films; a few, small and medium, woody roots; a few, small, water-rounded pebbles that are less than 10 millimeters in diameter; medium acid; clear, wavy boundary.

B_{22}—20 to 40 inches, dark-red (10R 3/6) clay; strong, fine and medium, subangular blocky structure; firm; thin and medium, prominent, discontinuous clay films; the clay films have a slightly darker color than the matrix; a few, small and medium, woody roots; a few, small, water-rounded pebbles that are less than 10 millimeters in diameter; medium acid; diffuse, wavy boundary.

B_{23}—40 to 51 inches, dark-red (10R 3/6) clay; strong, fine, angular blocky structure; firm; thin and medium, prominent, discontinuous clay films; a few, small, woody roots; a few, small, water-rounded pebbles that are less than 10 millimeters in diameter; medium acid; diffuse, wavy boundary.

B_3—51 to 128 inches +, dark-red (10R 3/6) clay; moderate, medium, subangular blocky structure; friable or firm; a few, thin, discontinuous clay films; a few, small, woody roots; a few, small, water-rounded pebbles that are less than 10 millimeters in diameter; common, fine sand grains; medium acid.

The A horizon ranges from dark brown to dark reddish brown in color and from 4 to 10 inches in thickness. The B horizon is dark red and is generally thicker than 36 inches.

In some places the slope is less than 2 percent. Some areas have had little or no erosion. In some areas the soil has a surface layer of fine sandy loam, and in a few small areas the surface layer is light-colored sandy loam. There are stones or pebbles that interfere with tillage in a few areas.

Hiwassee loam, 2 to 6 percent slopes, eroded, is medium in natural fertility, low in organic matter, and medium acid. It is moderate in available water capacity and in permeability.

This soil is suited to most row crops and to small grains, hay, pasture, and trees. Most of the acreage has been cleared. Much of it is still cultivated or is used for pasture, but some has reseeded to shortleaf or Virginia pines. If the soil is cultivated, practices are needed to protect it from further erosion. (Capability unit IIe–2; woodland group 4B)

Hiwassee loam, 6 to 10 percent slopes, eroded (HwC2).—This soil is on high terraces along the major streams of the county. In a few small areas, the slope is greater than 10 percent. In some areas the soil has a surface layer of fine sandy loam. There are enough stones or gravel to interfere with tillage in some areas.

This soil is suited to most row crops, small grains, hay, and pasture, and it is also suited to trees. Most of the acreage has been cleared, and much of it is still cultivated or is used for pasture. Some areas, however, have reseeded to shortleaf or Virginia pines. If this soil is cultivated, intensive practices are required to protect it from further erosion. (Capability unit IIIe–2; woodland group 4B)

Iredell Series

The Iredell series consists of moderately deep to shallow, gently sloping to strongly sloping soils of the uplands. The soils are somewhat poorly drained to moderately well drained. Their surface layer is very dark grayish-brown to olive, friable loam. Their subsoil is light olive-brown to dark yellowish-brown, very firm clay. In most places the bedrock, which is chiefly diorite and gabbro, is at a depth of less than 5 feet.

These soils are near the Lloyd, Davidson, Mecklenburg, and Wilkes soils. They are less red and are not so deep as the Lloyd, Davidson, and Mecklenburg soils. Their subsoil is more plastic than that of the Lloyd and Davidson soils, and they are more plastic throughout than the Mecklenburg soils. The Iredell soils have a profile that is better developed than that of the Wilkes soils, and it contains more clay.

These soils are medium in fertility, low in organic matter, and medium acid to slightly acid. They are low in available water capacity and have slow permeability.

The largest areas of these soils are near Elmwood and southeast of Mooresville. Small areas are in other parts of the county where dikes of basic rock have cut through or are surrounded by rocks of an earlier formation. Much of the acreage is cultivated or is used for pasture. The soils can be tilled only within a narrow range of moisture content, and the number of crops that can be grown is limited.

Iredell loam, 2 to 6 percent slopes, eroded (IrB2).—This soil is generally on the crests of ridges. It is mostly near Elmwood and southeast of Mooresville, but small areas are in other parts of the county. This soil is moderately well drained and has an A horizon of dark grayish-brown to olive, friable loam. The B horizon is light olive-brown to yellowish-brown, very firm clay.

The following describes a representative profile in a cultivated field, 200 feet southeast of Elmwood Church:

A_p—0 to 6 inches, dark-brown (10YR 4/3) loam; weak, very fine to fine, granular structure; friable; abundant, small, fibrous roots; many iron concretions that are as much as 3 millimeters in diameter; medium acid; abrupt, smooth boundary.

B_{21}—6 to 10 inches, dark yellowish-brown (10YR 4/4) clay; weak, medium and fine, subangular blocky structure; firm; fine, distinct, discontinuous clay films; a few, small, fibrous roots; a few iron concretions that are as much as 2 millimeters in diameter; medium acid; clear, smooth boundary.

B_{22}—10 to 16 inches, dark yellowish-brown (10YR 4/4) clay; a few, fine, distinct mottles of pale yellow (2.5Y 7/4); strong, medium and fine, angular blocky structure; very firm; prominent, continuous clay films; a few, fine, fibrous roots; medium acid; clear, smooth boundary.

B_3—16 to 23 inches, light olive-brown (2.5Y 5/6) clay; common, medium, faint mottles of pale yellow (2.5Y 7/4) and a few, medium, distinct mottles of yellowish brown (10YR 5/8); weak, medium, angular blocky structure to nearly massive; very firm; distinct and prominent discontinuous clay films; a few, fine, fibrous roots; contains black, disintegrated minerals; medium acid; diffuse, smooth boundary.

C—23 to 30 inches, mottled dark-brown, gray, and green, disintegrated basic rock; massive.

The A horizon is very dark grayish brown to olive and is 3 to 6 inches thick. The B horizon is yellowish brown to light olive brown and is 12 to 30 inches thick. The A and B layers combined are generally less than 30 inches thick.

In small areas this soil is severely eroded and has a surface layer of clay loam. In a few places the slope is less than 2 percent. The soil in a few areas is not eroded or is only slightly eroded. There are enough stones or pebbles in a few small areas to interfere with tillage.

Mapped with this soil are some areas of a soil that has a surface layer of fine sandy loam. Areas of this included soil are too small to be mapped separately.

Iredell loam, 2 to 6 percent slopes, eroded, is medium in fertility, low in organic matter, and medium acid to slightly acid. It has low available water capacity and slow permeability. Crops grown on it respond well to good management.

This soil is suited to cotton, corn, lespedeza, and pasture plants, and it is also suited to trees. Much of the acreage is cultivated or is used for pasture, but some is in forest. If this soil is cultivated, intensive practices ought to be

applied to protect it from further erosion. (Capability unit IIe–3; woodland group 7)

Iredell loam, 6 to 10 percent slopes, eroded (IrC2).—This soil is generally on side slopes in gently rolling areas. In small areas this soil is severely eroded and the surface layer is clay loam. In a few areas the soil is not eroded or is only slightly eroded. There are enough stones or pebbles to interfere with tillage in a few small areas.

Mapped with this soil are some small areas of a soil that has a surface layer of fine sandy loam. Also included are some small areas of a soil that has a slope of more than 10 percent.

Iredell loam, 6 to 10 percent slopes, eroded, is suited to cotton, corn, lespedeza, and pasture plants, and it is also suited to trees. Much of the acreage is cultivated or is used for pasture, but some is in trees. If this soil is cultivated, intensive practices are required to protect it from further erosion. (Capability unit IVe–3; woodland group 7)

Lloyd Series

The Lloyd series consists of deep, gently sloping to moderately steep, well-drained soils of the uplands. In areas that are not severely eroded, the surface layer is reddish-brown to dark reddish-brown or grayish-brown, friable loam or fine sandy loam. The subsoil is red to dark-red, friable or firm clay. In most places depth to bedrock of mixed acidic and basic igneous and metamorphic rocks is more than 5 feet, and in many places it is more than 20 feet. A profile of a Lloyd fine sandy loam is shown in figure 7.

Figure 7.—**This profile of a Lloyd fine sandy loam shows deep weathering in the underlying rocks; the length of the rod is 12 feet.**

These soils are near the Cecil, Davidson, and Mecklenburg soils. They have a browner surface layer than the Cecil soils and a subsoil that is darker red and contains less sand. They lack the distinct, light-colored, leached layer that is a part of the surface layer of the Cecil soils. The surface layer contains more sand than that of the Davidson soils, and the subsoil is lighter red. The Lloyd soils have a redder surface layer and subsoil than the Mecklenburg soils, and their subsoil is friable or firm clay rather than plastic clay.

The Lloyd soils are medium in natural fertility and are low in organic matter. They are medium acid and have moderate available water capacity and moderate permeability. Crops grown on these soils respond well if lime and fertilizer are added.

Areas of the Lloyd soils are generally large and are in all parts of the county. The soils are important for agriculture, and much of the acreage is cultivated or used for pasture. The less eroded areas are suited to many different crops, but they are especially well suited to alfalfa, pasture plants, and small grains.

Lloyd loam, 2 to 6 percent slopes (LmB).—This well-drained soil generally occupies large tracts on ridges in areas that are gently sloping. Its A horizon is reddish-brown to dark reddish-brown, very friable loam, and the B horizon is red to dark-red, friable clay.

The following describes a profile in a cultivated field, one-fourth mile north of the Hurst Turner American Legion Post on a gravel road, in a field west of the road:

A_p—0 to 6 inches, dark reddish-brown (2.5YR 3/4) loam; weak, fine and very fine, granular structure; very friable or friable; a few, small, fibrous roots; slightly acid; abrupt, smooth boundary.

B_1—6 to 9 inches, dark-red (2.5YR 3/6) clay loam; moderate, medium, subangular blocky structure; friable and sticky; plentiful tree roots; old root channels that contain small amounts of material from the former A_2 horizon; distinct, patchy clay films; medium to strongly acid; abrupt, smooth boundary.

B_{21}—9 to 21 inches, red to dark-red (2.5YR 4/6 to 3/6) clay; moderate, medium, subangular blocky structure; friable; a few tree roots; distinct, continuous clay films; strongly acid; clear, wavy boundary.

B_{22}—21 to 31 inches, red to dark-red (2.5YR 4/6 to 3/6) silty clay to clay; moderate, medium, subangular blocky structure; friable; a few tree roots; common, fine, mica flakes; distinct, continuous clay films; strongly acid; clear, wavy boundary.

B_3—31 to 45 inches, red to dark-red (2.5YR 4/6 to 3/6) silty clay loam; a few, medium and distinct mottles of reddish yellow (7.5YR 6/6) that are probably parent material; weak, medium, angular blocky structure; friable; a few, large tree roots; many, fine mica flakes; a few, distinct clay films on the vertical faces of peds; strongly acid; gradual, wavy boundary.

C_1—45 to 68 inches +, yellowish-red and red silt loam from highly weathered hornblende mica gneiss; mottled with yellow; has black flakes and specks and is highly micaceous; strongly acid.

The A horizon ranges from reddish brown to dark reddish brown in color and from 6 to 10 inches in thickness. The B horizon is red to dark red, and it is 18 to 60 inches thick. The A and B horizons combined generally are more than 36 inches thick.

In some small areas, especially at the toe of slopes, the soil has a fairly high content of mica. There are enough pebbles or stones to interfere with tillage in some areas. In a few small areas, the slope is less than 2 percent. Near Elmwood, a few small areas of a soil that has a subsoil of clay loam are mapped with this soil.

Lloyd loam, 2 to 6 percent slopes, is medium in fertility and low in organic matter. It is medium acid to strongly

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acid and has moderate permeability and available water capacity. Crops grown on this soil respond well if lime and fertilizer are added.

This soil is suited to row crops, small grains, hay, and pasture, and it is also suited to trees. Much of the acreage is cultivated or is used for pasture, but some is in forest consisting of old growth or of areas that have been cut over. If this soil is cultivated, practices ought to be applied to protect it from erosion. (Capability unit IIe–2; woodland group 4A)

Lloyd loam, 2 to 6 percent slopes, eroded (LmB2).—This soil has a thinner surface layer than Lloyd loam, 2 to 6 percent slopes. The surface layer is commonly reddish-brown to dark reddish-brown, friable loam and is 3 to 7 inches thick.

The soil is severely eroded in small areas and has a surface layer of red clay loam. There are a few gullies, and some of them are deep. In some areas, especially at the toe of slopes, the soil has a fairly high content of mica. There are enough pebbles or stones to interfere with tillage in some areas.

Near Elmwood, a few small areas of a soil that has a subsoil of clay loam are mapped with this soil.

Lloyd loam, 2 to 6 percent slopes, eroded, is suited to row crops, small grains, hay, and pasture, and it is also suited to trees. Most of it is cultivated or is used for pasture, but some of it has good stands of shortleaf and Virginia pines. Because the surface layer is fine textured as the result of erosion, the surface soil is likely to seal over and crust after hard rains. If this soil is cultivated, practices are required to protect it from further erosion. (Capability unit IIe–2; woodland group 4B)

Lloyd loam, 6 to 10 percent slopes (LmC).—This soil is on rolling ridges or on the gently rolling side slopes. In some small areas, especially at the toe of slopes, the soil has a fairly high content of mica. There are enough pebbles or stones in some places to interfere with tillage.

Near Elmwood, a few small areas of a soil that has a subsoil of clay are mapped with this soil.

Lloyd loam, 6 to 10 percent slopes, is suited to row crops, small grains, hay, and pasture, and it is also suited to trees. Much of the acreage is in forests consisting of old growth, or the areas have been cut over. Some of it is cultivated or used for pasture. On cultivated areas, intensive practices are needed to help control erosion. (Capability unit IIIe–2; woodland group 4A)

Lloyd loam, 6 to 10 percent slopes, eroded (LmC2).—This soil has a thinner surface layer than Lloyd loam, 2 to 6 percent slopes. The surface layer is commonly reddish-brown or dark reddish-brown, friable loam that is 3 to 5 inches thick.

In small areas this soil is severely eroded and has a surface layer of red clay loam. There are a few gullies, and some of them are deep. In some areas, especially at the toe of slopes, this soil has a fairly high content of mica. Pebbles or stones interfere with tillage in some places.

Near Elmwood, a few small areas of a soil that has a subsoil of clay loam are mapped with this soil.

Lloyd loam, 6 to 10 percent slopes, eroded, is suited to row crops, small grains, hay, and pasture, and it is also suited to trees. Much of it is cultivated or is used for pasture, but some of it has good stands of shortleaf and Virginia pines. Because the surface layer is fine textured, the surface soil is likely to seal over and crust after a hard rain. Intensive practices are required to protect this soil from further erosion. (Capability group IIIe–2; woodland group 4B)

Lloyd loam, 10 to 15 percent slopes (LmD).—This soil is generally on side slopes that border drainageways. It is shallower over bedrock then Lloyd loam, 2 to 6 percent slopes.

In some small areas this soil has a fairly high content of mica. Pebbles or stones interfere with tillage in some places.

Mapped with this soil are a few areas of Davidson clay loam, 10 to 15 percent slopes, that are too small to be mapped separately.

In some places Lloyd loam, 10 to 15 percent slopes, is suited to row crops, small grains, hay, and pasture. It is also suited to trees. Some areas are used for field crops or pasture, but in other places the soil has good stands of shortleaf and Virginia pines or of hardwoods of low quality. If this soil is cultivated, intensive practices are required to protect it from erosion. (Capability unit IVe–2; woodland group 4A)

Lloyd loam, 10 to 15 percent slopes, eroded (LmD2).—This soil is generally on side slopes that border drainageways. It has a thinner surface layer than Lloyd loam, 2 to 6 percent slopes, and it is shallower over bedrock. The surface layer is commonly reddish-brown to dark reddish-brown, friable loam and is 3 to 5 inches thick.

In small areas the soil is severely eroded and the surface layer is red clay loam. There are a few gullies, and some of them are deep. In some places the soil has a fairly high content of mica. Pebbles or stones interfere with tillage in places.

Mapped with this soil are a few areas of Davidson clay loam, 10 to 15 percent slopes, eroded, that are too small to be mapped separately.

Lloyd loam, 10 to 15 percent slopes, eroded, is suited to row crops, small grains, hay, and pasture. It is also suited to trees. All of the acreage has been cleared, but some of it has reseeded to shortleaf and Virginia pines. Because the surface layer is fine textured, the surface soil is likely to seal over and crust after a hard rain. If this soil is cultivated, intensive practices are required to protect it from further erosion. (Capability unit IVe–2; woodland group 4B)

Lloyd loam, 15 to 25 percent slopes (LmE).—This soil is generally on side slopes that border deeply cut drainageways. It is shallower over bedrock than Lloyd loam, 2 to 6 percent slopes, and its profile is not so well developed. In only a few places is the soil more than 36 inches thick.

In some areas this soil has a fairly high content of mica. There are pebbles or stones in some areas.

Mapped with this soil are some areas of a soil that has a slope of more than 25 percent. Also included are a few areas of Davidson clay loam, 15 to 25 percent slopes, that are too small to be mapped separately.

If Lloyd loam, 15 to 25 percent slopes, is cleared, it can be used for pasture and hay crops. The soil is not suited to row crops, because it has steep slopes and is highly susceptible to erosion. In some places this soil has good stands of pines and of hardwoods of low quality. In other areas it has reseeded to almost pure stands of short-

leaf and Virginia pines. (Capability unit VIe–1; woodland group 4A)

Lloyd loam, 15 to 25 percent slopes, eroded (LmE2).—This soil is generally on side slopes that border deeply cut drainageways. It has a thinner surface layer than Lloyd loam, 2 to 6 percent slopes, and its profile is not so well developed. The surface layer is commonly reddish-brown to dark reddish-brown, friable loam and is 3 to 5 inches thick.

In small areas this soil is severely eroded and has a surface layer of red clay loam. There are a few gullies, and some of them are deep. In some areas the soil has a fairly high content of mica. Some areas contain stones or gravel.

Mapped with this soil are some areas of a soil that has a slope of more than 25 percent. Also included are a few areas of Davidson clay loam, 15 to 25 percent slopes, that are too small to be mapped separately.

Lloyd loam, 15 to 25 percent slopes, eroded, is best used for pasture, hay, or trees. It is generally not suited to row crops, because it is highly susceptible to erosion. Because of the fine texture of the surface layer, the surface tends to seal over and crust after a hard rain. All of this soil has been cleared, but some of it has reseeded to shortleaf and Virginia pines. (Capability unit VIe–1; woodland group 4B)

Lloyd fine sandy loam, 2 to 6 percent slopes (LfB).—This soil is on gently sloping ridges. The largest area is north and northwest of Statesville, but the soil is in all parts of the county where there are other Lloyd soils. This soil is similar to Lloyd loam, 2 to 6 percent slopes, but it is coarser textured and the surface layer is grayish brown or reddish brown.

In some areas, especially at the toe of slopes, the soil has a fairly high content of mica. Pebbles or stones interfere with tillage in some areas. In a few areas the slope is less than 2 percent.

This soil is suited to row crops, small grains, hay, and pasture, and it is also suited to trees. Much of the acreage is in forests that consist of old growth or have been cut over, but some is cultivated or is used for pasture. Erosion is not a serious problem, but practices ought to be applied to protect the soil. (Capability unit IIe–1; woodland group 4A)

Lloyd fine sandy loam, 2 to 6 percent slopes, eroded (LfB2).—This soil is on gently sloping ridges. It has a thinner surface layer than Lloyd loam, 2 to 6 percent slopes, and is coarser textured. The surface layer is commonly reddish-brown or grayish-brown, friable fine sandy loam and is 3 to 6 inches thick.

In small areas the soil is severely eroded and the surface layer is red clay loam. There are a few gullies, and some of them are deep. In some places, especially at the toe of slopes, the soil has a fairly high content of mica. Pebbles or stones interfere with tillage in some areas.

This soil is suited to row crops, small grains, hay, and pasture, and it is also suited to trees. It is important for agriculture, and most of it is cultivated or is used for pasture. Some of it is in good stands of shortleaf or Virginia pines. If this soil is cultivated, practices should be applied to prevent further erosion. (Capability unit IIe–1; woodland group 4B)

Lloyd fine sandy loam, 6 to 10 percent slopes (LfC).—This soil is on rolling ridges and on gently rolling side slopes. It is coarser textured than Lloyd loam, 2 to 6 percent slopes, and the surface layer is grayish brown or reddish brown.

In some areas, especially at the toe of slopes, the soil has a fairly high content of mica. In places pebbles or stones interfere with tillage.

This soil is suited to row crops, small grains, and hay; to pasture; and to trees. Much of the acreage is in forests that consist of old growth or that have been cut over, but some is cultivated or is used for pasture. When this soil is cultivated, intensive practices are required to protect it from erosion. (Capability unit IIIe–1; woodland group 4A)

Lloyd fine sandy loam, 6 to 10 percent slopes, eroded (LfC2).—This soil is on rolling ridges or on gently rolling side slopes. It has a thinner surface layer than Lloyd loam, 2 to 6 percent slopes, and it is coarser textured. The surface layer is commonly reddish-brown or grayish-brown, friable fine sandy loam and is 3 to 5 inches thick.

In many small areas the soil is severely eroded and the surface layer is red clay loam. There are a few gullies, and some of them are deep. In some areas, especially at the toe of slopes, the soil has a fairly high content of mica. In some places, pebbles or stones interfere with tillage.

This soil is suited to row crops, small grains, hay, and pasture, and it is also suited to trees. It is important for agriculture, and much of the acreage is cultivated or used for pasture. Some of the acreage has good stands of shortleaf and Virginia pines. Because of the hazard of erosion, intensive practices are required to protect the soil when it is cultivated. (Capability unit IIIe–1; woodland group 4B)

Lloyd fine sandy loam, 10 to 15 percent slopes (LfD).—This soil is generally on side slopes that border drainageways. It is shallower over bedrock than Lloyd loam, 2 to 6 percent slopes, and it is coarser textured. The surface layer is grayish brown or reddish brown.

In some areas this soil has a fairly high content of mica. In some places, pebbles or stones interfere with tillage.

This soil is suited to row crops, small grains, hay, and pasture crops, and in some places it is used to grow these crops. In other places there are good stands of shortleaf and Virginia pines and of hardwoods of low quality. If this soil is cultivated, intensive practices are required to protect it from erosion. (Capability unit IVe–1; woodland group 4A)

Lloyd fine sandy loam, 10 to 15 percent slopes, eroded (LfD2).—This soil is generally on side slopes that border drainageways. It is shallower over bedrock than Lloyd loam, 2 to 6 percent slopes, and its surface layer is thinner and coarser textured. The surface layer is commonly reddish-brown or grayish-brown, friable fine sandy loam and is 3 to 5 inches thick.

In many small areas this soil is severely eroded and has a surface layer of red clay loam. There are a few gullies, and some of them are deep. In some places the soil has a fairly high content of mica. Pebbles or stones interfere with tillage in some places.

This soil is suited to row crops, small grains, hay, and pasture, and it is also suited to trees. All of the acre-

age has been cleared, but some of it has reseeded to shortleaf or Virginia pines. If this soil is cultivated, intensive practices are required to protect it from further erosion. (Capability unit IVe–1; woodland group 4B)

Lloyd fine sandy loam, 15 to 25 percent slopes (LfE).—This soil is generally on side slopes that border deeply cut drainageways. It is shallower over bedrock than Lloyd loam, 2 to 6 percent slopes, its profile is not so well developed, and it is coarser textured. The surface layer is grayish brown or reddish brown. In only a few places is this soil more than 36 inches thick.

In some areas this soil has a fairly high content of mica. There are pebbles and stones in places.

Mapped with this soil are some areas of a soil that has a slope of more than 25 percent.

Lloyd fine sandy loam, 15 to 25 percent slopes, can be used for pasture and hay crops when it is cleared. The soil is generally not suited to row crops, because its steep slopes make it highly susceptible to erosion. In some places this soil has a good stand of pines or of hardwoods of low quality. In other places it has reseeded to almost pure stands of shortleaf and Virginia pines. (Capability unit VIe–1; woodland group 4A)

Lloyd fine sandy loam, 15 to 25 percent slopes, eroded (LfE2).—This soil is generally on side slopes that border deeply cut drainageways. It has a thinner, coarser textured surface layer than Lloyd loam, 2 to 6 percent slopes, and its profile is not so well developed. The surface layer is commonly reddish-brown or grayish-brown, friable fine sandy loam and is 3 to 5 inches thick.

In many small areas this soil is severely eroded and has a surface layer of red clay loam. There are a few gullies, and some of them are deep. In some places the soil has a fairly high content of mica. There are pebbles or stones in places.

Mapped with this soil are some areas of a soil that has a slope of more than 25 percent.

Lloyd fine sandy loam, 15 to 25 percent slopes, eroded, can be used for hay or pasture, or it can be used to grow trees. It is generally not suited to row crops, because it is highly susceptible to erosion. All of the acreage has been cleared, but some of it has reseeded to shortleaf and Virginia pines. (Capability unit VIe–1; woodland group 4B)

Lloyd clay loam, 6 to 10 percent slopes, severely eroded (LcC3).—This soil has a thinner, finer textured surface layer than Lloyd loam, 2 to 6 percent slopes, and the profile is generally shallower over bedrock. The surface layer is red clay loam and is 4 to 6 inches thick. It consists mostly of material from the former subsoil that has been mixed with material from the original surface layer. In places as much as 25 percent of an area is made up of shallow gullies.

The following describes a representative profile in a pasture, 80 yards north of U.S. Highway No. 70, ½ mile east of White Oak Store:

A_p—0 to 4 inches, dark-red (2.5YR 3/6) clay loam; moderate, medium, granular structure; friable when moist, hard when dry; abundant, fibrous roots; medium acid; clear, wavy boundary.

B_2—4 to 24 inches, dark-red (2.5YR 3/6) clay; moderate, medium, subangular blocky structure; firm; plentiful, fibrous roots; prominent, continuous clay films; a few angular grains of quartz; medium acid; gradual, wavy boundary.

B_3—24 to 37 inches, red (2.5YR 4/6) clay; moderate, medium, subangular blocky structure; firm; prominent, discontinuous clay films; a few, small, angular grains of quartz; a few, fine, distinct mottles of reddish yellow (5YR 6/8) to yellowish red (5YR 4/8); medium acid; clear, wavy boundary..

C—37 to 50 inches +, red and yellow clay matrix and disintegrated rocks and minerals; massive.

This soil has poorer tilth than Lloyd loam, 2 to 6 percent slopes, and it takes in water more slowly. The soil can be worked only within a narrow range of moisture content. Because of the fine texture of the surface layer, the surface of the soil puddles and crusts after hard rains. Therefore, it is difficult to obtain a good stand of crops.

Lloyd clay loam, 6 to 10 percent slopes, severely eroded, is suited to small grains, hay, and pasture, and it is also suited to trees. It can be used for row crops if intensive practices are used to prevent further erosion. At the present time, however, much of the acreage has a cover of broomsedge, briers, and honeysuckle, and a scattering of pines. Some areas have reseeded to almost pure stands of Virginia pine, but some areas are still cultivated. (Capability unit IVe–2; woodland group 4C)

Lloyd clay loam, 2 to 6 percent slopes, severely eroded (LcB3).—This soil is in all parts of the county where there are other Lloyd soils. Its slopes are more gentle than those of Lloyd clay loam, 6 to 10 percent slopes, severely eroded, and it has fewer gullies.

This soil is difficult to till because it can be worked only within a narrow range of moisture content. Because of the fine texture of the surface layer, the surface of the soil puddles and crusts after a hard rain. It is, therefore, difficult to obtain a good stand of crops.

Good yields of row crops, small grains, hay, and pasture crops can be obtained on this soil, but intensive practices are required to prevent further erosion. Much of the acreage has a cover of broomsedge, briers, and honeysuckle, and there is also a scattering of pines. Some areas have reseeded to almost pure stands of Virginia pine, but some areas are still cultivated. (Capability unit IIIe–2; woodland group 4C)

Lloyd clay loam, 10 to 15 percent slopes, severely eroded (LcD3). This soil is in all parts of the county where there are other Lloyd soils. It has stronger slopes than Lloyd clay loam, 6 to 10 percent slopes, severely eroded, and it is generally not suited to cultivation.

Mapped with this soil are areas of Davidson clay loam, 10 to 15 percent slopes, severely eroded, that are too small to be mapped separately.

Lloyd clay loam, 10 to 15 percent slopes, severely eroded, is difficult to till, and it takes in water slowly. The soil can be worked only within a narrow range of moisture content. Because of the fine texture of the surface layer, the surface of the soil puddles and crusts after a hard rain. Therefore, it is difficult to obtain a good stand of forage crops and of other crops that are grown.

Fair yields of pasture and hay crops can be obtained on this soil, but intensive practices are needed to control erosion. Most of the acreage is idle or is covered with almost pure stands of Virginia pine. (Capability unit VIe–2; woodland group 4C)

Lloyd clay loam, 15 to 25 percent slopes, severely eroded (LcE3).—This soil is in all parts of the county where there are other Lloyd soils. It is steeper than Lloyd clay loam, 6 to 10 percent slopes, severely eroded, and it is shal-

lower over bedrock. This soil generally is less than 30 inches thick.

This soil is too steep and eroded for cultivated crops or for hay or pasture. Most of it is idle or has stands of Virginia pine. The yield of pines is poor, but, after they are established, pines help prevent further erosion. (Capability unit VIIe–2; woodland group 4C)

Local Alluvial Land

Alluvial deposits that have been washed fairly short distances from other areas are mapped as Local alluvial land.

Local alluvial land (lo).—This land type is distributed throughout the county, but it is not important for agriculture, because of its small acreage. It is gently sloping and consists of well drained to moderately well drained local alluvial material washed from sandy soils of the uplands. The areas are in drainageways and at the base of slopes where fresh material is added frequently as the result of overwash and deposition. The slope is 0 to 2 percent.

The soil material in this land type is 24 inches or more thick. The color ranges from grayish brown to yellowish red, but it is commonly grayish brown to light yellowish brown. The texture ranges from loamy sand through clay loam, but in most places it is sandy loam or fine sandy loam. There is no structural development.

Within some areas of this land type, there is a soil that has a surface layer of sandy loam and a subsoil of yellow to yellowish-red clay loam.

Local alluvial land is near soils of the uplands. The areas that are light colored and that have a texture of sandy loam are generally near the Cecil and Appling soils. The darker colored, finer textured areas are near the Cecil and Lloyd soils. In places this land type is near the Starr soils and is in similar positions, but it is made up of more recent deposits than the Starr soils and lacks distinct horizons.

The soil material in this land type is medium to low in fertility and is low in organic matter. It has medium available water capacity and moderate to rapid permeability. The soil material is friable and has good tilth.

Local alluvial land can be used for cultivated crops and for grasses that are suited to this area, and it can also be used to grow trees. The areas are small, and they are, therefore, generally used the same as surrounding areas. (Capability unit IIe–1; woodland group 1)

Louisa Series

The Louisa series is made up of moderately shallow to shallow, sloping to steep, excessively drained soils of the uplands. The soils consist of light yellowish-brown to brown and reddish-yellow, very friable fine sandy loam or sandy loam that contains many mica flakes. In places the subsoil is red to reddish-yellow, friable loam that contains many large mica flakes and is 3 to 9 inches thick. The bedrock of mica gneiss and mica schist is at a depth of 1½ to 3 feet in most places.

In Iredell County the Louisa soils are mapped only in undifferentiated units with the Louisburg soils. A profile of a Louisa soil is described under Louisburg and Louisa soils, 25 to 55 percent slopes, in the Louisburg series.

Louisburg Series

The Louisburg series consists of soils that are moderately shallow to shallow over bedrock. The soils are on uplands, are excessively drained, and are sloping to steep. The surface layer is light yellowish-brown, or brownish-yellow to dark grayish-brown, very friable sandy loam or fine sandy loam. In most places it is underlain by light yellowish-brown to yellowish-brown, very friable sandy loam. In some places there is a thin, discontinuous B horizon of yellowish-brown to strong-brown, very friable sandy clay loam that is 2 to 4 inches thick, but in most places this layer is lacking. The bedrock of granite and granite gneiss is at a depth of 2 to 4 feet in most places.

These soils are near the Cecil, Appling, and Wilkes soils. They are not so well developed, are shallower over bedrock, and contain more sand throughout the profile than the Cecil and Appling soils. Also, they are less red than the Cecil soils. In most places the Louisburg soils have more sand throughout the profile than the Wilkes soils and contain a smaller amount of dark-colored minerals.

The Louisburg soils are low in fertility and in organic matter. They are strongly acid and have low available water capacity and rapid permeability.

These soils are in most parts of the county, but they are not important for agriculture, because they are suited to only a few crops. Most of the acreage is in trees, but some areas are in crops or are used for pasture, and some of the acreage is idle.

In Iredell County the Louisburg soils are mapped only in undifferentiated mapping units with the Louisa soils. The soils are mapped together because they occur in similar positions and are used and managed the same.

Louisburg and Louisa soils, 25 to 55 percent slopes (loF).—These soils are shallow over bedrock. They are very friable and are excessively drained. The A horizon is commonly light yellowish-brown or brownish-yellow to dark grayish-brown, very friable sandy loam or fine sandy loam. In some places it contains pebbles of mica and schist. In most places the B horizon is lacking, but, if it is present, it is red to yellowish-red, or yellowish-brown to strong-brown, friable clay loam or sandy clay loam. The C horizon is light yellowish-brown to yellowish-brown or brown to reddish-yellow, very friable sandy loam that contains mica in some places.

The following describes a profile of a Louisburg soil taken in a forest, 2 miles west of Brawley School, five-eighths mile north of the intersection and 900 feet east of the road:

A_{00}—1½ inches to ½ inch of a mixture of litter from hardwoods and pines.

A_0—½ inch or less of dark-gray, partly decomposed and decomposed organic matter.

A_{11}—0 to 2 inches, dark grayish brown (2.5Y 4/2) sandy loam; weak, medium, granular structure; very friable; abundant, small and medium, woody roots; fingers of the A_2 horizon protrude into this horizon; strongly acid; abrupt, wavy boundary.

A_{12}—2 to 11 inches, brownish-yellow (10YR 6/6) sandy loam; weak, medium and coarse, granular structure; friable; plentiful, small, woody roots; common, finely divided mica flakes; a few quartz pebbles; strongly acid; clear, wavy boundary.

C_1—11 to 16 inches, yellowish-brown (10YR 5/6) sandy loam; weak, medium and coarse, granular structure; friable; a few, small, woody roots; common, finely divided mica flakes; some weathered parent material; strongly acid; abrupt, wavy boundary.

C_2—16 to 24 inches, yellowish-brown, brownish-yellow, strong-brown, and gray, disintegrated rock.

The following is a description of a Louisa soil in a forest, 0.4 mile west of Buffalo Creek Bridge on U.S. Highway No. 70, 0.75 mile south on a private road, 200 feet southeast of the road:

A_{00}—2½ inches of litter from hardwoods.

A_0—½ inch or less of partly decomposed and decomposed, black organic material.

A_1—0 to 2 inches, yellowish-brown (10YR 4/4) sandy loam; weak, medium, granular structure; friable; abundant, medium and small, woody roots; many, coarse mica flakes; plentiful schist pebbles; strongly acid; abrupt, wavy boundary.

A_2—2 to 6 inches, reddish-yellow (7.5YR 7/8) fine sandy loam; weak, medium, granular structure; friable; abundant, small and medium, woody roots; many, coarse mica flakes; plentiful schist pebbles; strongly acid; clear, wavy boundary.

B—6 to 15 inches, yellowish-red (5YR 5/8) clay loam; weak, medium, subangular blocky structure that breaks to massive; friable; a few, thin, distinct, discontinuous clay films; plentiful, medium and small, woody roots; many, coarse mica flakes; a few, small, quartz pebbles; black coatings around old root channels; strongly acid; clear, wavy boundary.

C_1—15 to 23 inches, yellowish-red clay loam matrix and partly disintegrated fragments of quartz mica schist; many, coarse mica flakes; friable; a few, thin, discontinuous clay films; plentiful, small, woody roots; clear, wavy boundary.

C_2—23 to 31 inches, weathered, reddish-yellow, disintegrated rock; friable; a few, small, woody roots; many fragments of mica schist.

In this profile of a Louisa soil, depth to bedrock is 31 inches, but, in most places in the Louisburg and Louisa soils, bedrock is at a depth of less than 30 inches. The soils are generally on steep side slopes. In places there are small areas where stones, gravel, or bedrock outcrops.

The soils are low in fertility and in organic matter. They are strongly acid to medium acid, have low available water capacity, and are rapidly permeable.

These soils are not suited to cultivation. They are best used for trees, and most of the acreage is in hardwoods consisting of old growth. (Capability unit VIIe–1; woodland group 6)

Louisburg and Louisa soils, 6 to 10 percent slopes (LuC).—These soils are on ridges, generally in rough, broken areas. They are less steep than Louisburg and Louisa soils, 25 to 55 percent slopes, and generally they are deeper.

In small areas there are outcrops of stones, gravel, and rocks. In some places there are gullies that are as much as 18 inches deep. In a few areas the slope is less than 6 percent.

In some places Louisburg and Louisa soils, 6 to 10 percent slopes, has tobacco, other row crops, and pasture and hay crops growing on it. If the soils are cultivated, intensive practices are needed to protect them from erosion. Much of the acreage, however, is in forest. (Capability unit IVe–3; woodland group 6)

Louisburg and Louisa soils, 10 to 15 percent slopes (LuD).—These soils are on side slopes that border drainageways or on ridges in hilly areas. They are not so steep and generally are deeper than Louisburg and Louisa soils, 25 to 55 percent slopes.

In some small areas there are stones and outcrops of gravel and rocks. In some areas there are gullies that are as much as 18 inches deep.

In some places Louisburg and Louisa soils, 10 to 15 percent slopes, is used for row crops or for hay or pasture. Most of the acreage, however, is in shortleaf and Virginia pines or in hardwoods of low quality. If the soils are cultivated, intensive practices are needed to control erosion. (Capability unit VIe–3; woodland group 6)

Louisburg and Louisa soils, 15 to 25 percent slopes (LuE).—Some areas of these soils are on side slopes next to drainageways. Others are on slopes that descend from ridge crests toward steeper slopes below. They are less steep than Louisburg and Louisa soils, 25 to 55 percent slopes, but they are otherwise similar. In small areas there are stones, gravel, and rock outcrops.

These soils are not suited to cultivation and are best used for trees. Most of the acreage is in hardwoods of low quality, but some is in shortleaf and Virginia pines. (Capability unit VIIe–1; woodland group 6)

Made Land

This miscellaneous land type consists of areas that have been altered by man so that the original profile and topography of the soil cannot be recognized.

Made land (Ma).—This land type is made up of areas 2 acres or more in size that have been filled with soil material, gravel, trash, or a mixture of all three. All or most of the original surface layer and subsoil have been removed, and the soil type cannot be determined.

Most of this mapping unit is near towns or cities. Some of the areas have been made by cutting or filling to provide parking lots, a highway cloverleaf, or for industrial and business use. Other areas were once dumps but are no longer used for that purpose. Road or railroad cuts and fills are not in this unit. Made land has not been given a capability classification, nor has it been placed in a woodland group.

Madison Series

The Madison series consists of gently sloping to steep, gravelly soils of the uplands. The soils are well drained. They are shallow or moderately shallow over bedrock. In the less eroded areas, the surface layer is grayish-brown to reddish-brown, friable gravelly fine sandy loam. Small schist pebbles are on the surface, and 20 percent or more of the surface layer is made up of pebbles. The subsoil is red to yellowish-red, friable clay loam to clay and contains schist gravel throughout. The content of mica generally increases with increasing depth.

The layer of disintegrated rock is generally less than 5 inches thick. Bedrock is chiefly quartz mica schist, and much of it contains garnet. Depth to bedrock is commonly about 3 feet, but the depth varies considerably within a fairly short horizontal distance. In some places bedrock is within 18 inches of the surface, but it is as deep as 4 feet in other places.

These soils are near the Cecil, Louisburg, and Louisa soils. They contain more gravel than the Cecil soils, and

their subsoil is not so well developed. Also, they have a thinner solum than the Cecil soils and contain more mica, especially in the lower part of the subsoil. The profile of the Madison soils is better developed than that of the Louisburg or Louisa soils, and it contains more gravel.

The Madison soils are low in fertility and in organic matter. They are medium acid to strongly acid and have moderate available water capacity and moderate permeability. The soils are easy to till and can be tilled within a wide range of moisture content. Crops grown on them respond well if lime and fertilizer are added.

These soils occupy large areas in the west-central and north-central parts of the county, and they occupy small areas in most other parts. They are good for agriculture, but much of the acreage has slopes of more than 10 percent. These soils are suited to tobacco, cotton, small grains, hay, and pasture, and they are also suited to trees. Some of the acreage is cultivated or is used for pasture, but most of it is in forest.

Madison gravelly fine sandy loam, 2 to 6 percent slopes (MdB).—This well-drained soil is on ridges in the uplands. It is mostly in the west-central and north-central parts of the county. The soil is shallow to moderately shallow over bedrock, and it contains gravel. The A horizon is grayish-brown to reddish-brown, friable gravelly fine sandy loam. The B horizon is red to yellowish-red, friable clay loam.

The following describes a representative profile in a forest of hardwoods and pines, 40 yards east of State Highway No. 115, 4.4 miles north of Central School:

A_{00}—3 inches to 1½ inches of litter from hardwoods and pines.
A_0—½ inch or less of black, partly decomposed organic material.
A_1—0 to 4 inches, very dark grayish-brown (10YR 3/2) fine sandy loam; weak, medium, granular structure; friable; many schist fragments that are ½ inch to 3 inches in diameter; abundant tree roots; a few mica flakes; strongly acid; clear, smooth boundary.
A_2—4 to 6 inches, yellowish-brown (10YR 5/4) fine sandy loam; weak, medium, granular structure; friable; abundant tree roots; many schist fragments as much as 2 inches in diameter; a few mica flakes; medium acid; clear, smooth boundary.
B_1—6 to 10 inches, yellowish-red (5YR 4/6) clay loam; weak, medium, subangular blocky structure; friable; clay films on the faces of peds adjacent to pebbles; plentiful tree roots; plentiful schist fragments that are as much as 1½ inches in diameter; a few, finely divided mica flakes; medium acid; clear, wavy boundary.
B_2—10 to 25 inches, red (2.5YR 4/6) clay loam; weak, medium, subangular blocky structure; friable; distinct, continuous coatings on peds; a few grains of quartz sand; a few, finely divided mica flakes; plentiful tree roots; plentiful, large, partly disintegrated schist fragments; medium acid; clear, wavy boundary.
B_3—25 to 28 inches, red (2.5YR 4/8) clay loam; weak, medium, subangular blocky structure; friable; a few woody roots; common, finely divided mica flakes; plentiful, large, partly disintegrated schist fragments; distinct, discontinuous clay films; medium acid; clear, wavy boundary.
C—28 to 36 inches red, highly weathered micaceous schist that has clay loam between the cracks in the rock; massive.
D—36 inches +, bedrock of mica schist.

The A horizon ranges from grayish brown to reddish brown in color and from 6 to 10 inches in thickness. The B horizon is red to yellowish red and is 12 to 24 inches thick. There is gravel throughout the profile. In a few areas there are stones on the surface.

Mapped with this soil are a few areas of a soil that contains schist gravel only in the surface layer and that has more clay in the subsoil than typical for soils of this series.

Madison gravelly fine sandy loam, 2 to 6 percent slopes, is low in fertility and in organic matter. It is medium acid to strongly acid, has moderate available water capacity, and is moderately permeable. Crops grown on this soil respond well if lime and fertilizer are added.

This soil is suited to many different crops, including tobacco, corn, small grains, and hay and pasture plants that grow in the area. It is also suited to trees. Most of the acreage is in shortleaf or Virginia pines or in hardwoods of low quality, but some has been cleared and is used for crops and pasture. If this soil is cultivated, practices ought to be applied to protect it from erosion. (Capability unit IIe–1; woodland group 4A)

Madison gravelly fine sandy loam, 2 to 6 percent slopes, eroded (MdB2).—This soil is on gently sloping ridges in all parts of the county where there are other Madison soils. It has a thinner surface layer than Madison gravelly fine sandy loam, 2 to 6 percent slopes. In many small areas the soil is severely eroded and the surface layer is reddish-brown gravelly clay loam. In a few areas there are stones on the surface. There are a few gullies, and some of them are deep.

Mapped with this soil are a few areas of a soil that contains schist gravel only in the surface layer and has more clay in the subsoil than is typical for soils of this series.

Madison gravelly fine sandy loam, 2 to 6 percent slopes, eroded, is suited to tobacco, cotton, corn, small grains, and pasture, and it is also suited to trees. Most of the acreage is cultivated or is used for pasture, but some is in shortleaf and Virginia pines. If this soil is cultivated, practices ought to be used to protect it from erosion. (Capability unit IIe–1; woodland group 4B)

Madison gravelly fine sandy loam, 6 to 10 percent slopes (MdC).—This soil is on ridges and side slopes. It is steeper than Madison gravelly fine sandy loam, 2 to 6 percent slopes. In a few areas there are stones on the surface.

Mapped with this soil are a few areas of a soil that has schist gravel only in the surface layer and has more clay in the subsoil than is typical for the soils of this series.

Madison gravelly fine sandy loam, 6 to 10 percent slopes, is suited to row crops, small grains, and pasture, and it is also suited to trees. Most of it is in forests consisting of old growth or in areas that have been cut over, but some of it is cultivated or in pasture. If this soil is cultivated, intensive practices ought to be applied to help control erosion. (Capability unit IIIe–1; woodland group 4A)

Madison gravelly fine sandy loam, 6 to 10 percent slopes, eroded (MdC2).—This soil is on ridges and side slopes in all parts of the county where there are other Madison soils. It is steeper and has a thinner surface layer than Madison gravelly fine sandy loam, 2 to 6 percent slopes. In many small areas the soil is severely eroded and the surface layer is reddish-brown gravelly clay loam. There are a few gullies, and some of them are deep. A few areas have stones on the surface.

Mapped with this soil are a few areas of a soil that has schist gravel only in the surface layer and has more clay in the subsoil than is typical for soils of this series.

Madison gravelly fine sandy loam, 6 to 10 percent slopes, eroded, is suited to row crops, small grains, and pasture, and it is also suited to trees. Most of it is cultivated or in pasture, but some is in shortleaf and Virginia pines. If this soil is cultivated, intensive practices are required to protect it from further erosion. (Capability unit IIIe–1; woodland group 4B)

Madison gravelly fine sandy loam, 10 to 15 percent slopes (MdD).—This soil is generally on side slopes that border drainageways. It is steeper and shallower over bedrock than Madison gravelly fine sandy loam, 2 to 6 percent slopes. In places there are rock outcrops and stones on the surface.

This soil is suited to row crops, small grains, and pasture, and it is also suited to trees. Most of it is in forests consisting of old growth or in areas that have been cut over. The trees are mainly oak and hickory, but in places there are some shortleaf and Virginia pines. In some other areas the soil is cultivated or is in pasture. If this soil is cultivated, intensive practices are required to protect it from erosion. (Capability unit IVe–1; woodland group 4A)

Madison gravelly fine sandy loam, 10 to 15 percent slopes, eroded (MdD2).—This soil is generally on side slopes that border drainageways. It is steeper and shallower over bedrock than Madison gravelly fine sandy loam, 2 to 6 percent slopes, and it has a thinner surface layer.

In many small areas the soil is severely eroded and has a surface layer of reddish-brown gravelly clay loam. There are a few gullies, and some of them are deep. In places there are rock outcrops and stones on the surface.

This soil is suited to row crops, small grains, and pasture, and it is also suited to trees. It has been cleared, but in some places it has reseeded to shortleaf and Virginia pines, and some areas are cultivated or are used for pasture. If this soil is cultivated, intensive practices are required to protect it from further erosion. (Capability unit IVe–1; woodland group 4B)

Madison gravelly fine sandy loam, 15 to 25 percent slopes (MdE).—This soil is generally on side slopes that border deeply cut drainageways. It is steeper than Madison gravelly fine sandy loam, 2 to 6 percent slopes, and it is shallower over bedrock. Also, its profile is not so well developed. There are rock outcrops and stones in places.

This soil is not suited to row crops, because it is highly erodible, but it can be used for pasture when it is cleared. Much of the acreage is in hardwoods of low quality, mostly oak and hickory. In some places there are shortleaf and Virginia pines, and other areas are in pasture. (Capability unit VIe-1; woodland group 4A)

Madison gravelly fine sandy loam, 15 to 25 percent slopes, eroded (MdE2).—This soil is generally on side slopes that border deeply cut drainageways. It is steeper than Madison gravelly fine sandy loam, 2 to 6 percent slopes, and it is shallower over bedrock. Also, it has a thinner surface layer and its profile is not so well developed. In many small areas the soil is severely eroded and the surface layer is reddish-brown gravelly clay loam. There are a few gullies, and some of them are deep. In places there are rock outcrops and stones on the surface.

This soil is not suited to row crops, because it is highly erodible. If it is cleared, it can be used for pasture. All of the acreage has been cleared, but some of it has reseeded to shortleaf and Virginia pines. Some of it is still cultivated or in pasture. (Capability unit VIe-1; woodland group 4B)

Madison gravelly fine sandy loam, 25 to 45 percent slopes (MdF).—This soil is generally on side slopes that border major drainageways or is in other steep areas. It is steeper than Madison gravelly fine sandy loam, 2 to 6 percent slopes, and it is shallower over bedrock. Also, its profile is not so well developed. In a few small areas, the soil is moderately eroded. There are rock outcrops and stones in places.

Madison gravelly fine sandy loam, 25 to 45 percent slopes, is not suited to row crops, because of the severe hazard of erosion, but it can be used for trees. Most of the acreage is in hardwoods of low quality, mostly oak and hickory, but some is in shortleaf and Virginia pines. (Capability unit VIIe-1; woodland group 4A)

Mayodan Series

The Mayodan series consists of deep, gently sloping, well-drained soils of the uplands. In the less eroded areas, the surface layer is commonly yellowish-brown, friable sandy loam. The subsoil is strong-brown to yellowish-red, friable or firm clay and is generally mottled with red and yellow. The soils are underlain by Triassic sandstone or by other sediments of the Triassic basins.

These soils are near the Cecil, Colfax, and Appling soils. They have a thicker surface layer and a yellower subsoil than the Cecil soils, and they are better drained and redder than the Colfax soils. The Mayodan soils are similar to the Appling soils in appearance, but they formed from different materials and have different chemical characteristics.

The Mayodan soils are low in fertility and in organic matter. They are strongly acid and have moderate available water capacity and moderate permeability. These soils are easy to till. Crops grown on them respond well if lime and fertilizer are added.

These soils occur only near the community of V-Point. They are suited to many different crops, but they are especially well suited to tobacco. Some of the acreage is in forests consisting of old-growth hardwoods of low quality, but most of it is cultivated or in pasture.

Mayodan sandy loam, 2 to 6 percent slopes, eroded (MfB2).—This is the only Mayodan soil mapped in the county. It is a gently sloping, well-drained soil on broad ridges of the uplands. Its A horizon is dark grayish-brown to light yellowish-brown, friable sandy loam. The B horizon is yellowish-red to strong-brown, friable or firm clay that is generally mottled with red and yellow.

The following describes a representative profile in a cultivated field, one-fourth mile south of the community of V-Point, 20 yards east of the road:

A_p—0 to 6 inches, yellowish-brown (10YR 5/4) sandy loam; weak, coarse and medium, granular structure; very friable; plentiful, small, fibrous roots; strongly acid; abrupt, smooth boundary.

B_{21}—6 to 19 inches, yellowish-red (5YR 5/8) clay; a few, fine, distinct mottles of red (2.5YR 4/8); moderate, fine and medium, subangular blocky structure; friable; distinct, discontinuous clay films; a few, small, fibrous roots; strongly acid; clear, smooth boundary.

B_{22}—19 to 25 inches, strong-brown (7.5YR 5/8) clay; a few fine, distinct mottles of red (2.5YR 4/8) and a few, medium, distinct mottles of yellowish brown (10YR 5/8); moderate, medium, subangular blocky structure; friable; distinct, discontinuous clay films; a few, small, fibrous roots; a few quartz pebbles as large as 2 inches in diameter; very strongly acid; clear, smooth boundary.

B_3—25 to 34 inches, strong-brown (7.5YR 5/8) silty clay; common, medium, distinct mottles of red (2.5YR 4/8) and yellowish brown (10YR 5/8); moderate, medium, subangular blocky structure; friable; distinct, discontinuous clay films; common, fine mica flakes; a small amount of weathered parent material; very strongly acid; clear, smooth boundary.

C—34 to 60 inches, mixture of red and yellow, disintegrated rock; massive; many, finely divided mica flakes.

The A horizon ranges from dark grayish brown to light yellowish brown in color and from 7 to 12 inches in thickness. The B horizon consists of yellowish-red to strong-brown clay that is commonly mottled with red and yellow. It is 24 to 40 inches thick. The A and B horizons combined generally are more than 36 inches thick.

In a few areas the slope is less than 2 percent, and in a few areas it is more than 6 percent.

Mapped with this soil are some areas of a soil that has a surface layer of light yellowish-brown sandy loam and a subsoil of yellow to yellowish-brown clay. The subsoil is mottled with strong brown and red at a depth below 24 inches.

This soil is low in fertility and in organic matter. It is strongly acid and has moderate available water capacity and moderate permeability. Crops grown on this soil respond well if lime and fertilizer are added.

This soil is suited to row crops, especially tobacco. It is also suited to small grains, hay, pasture, and trees. Most of the acreage is cultivated, but some is in forests consisting of old growth or of areas that have been cut over. If this soil is cultivated, practices should be applied to protect it from erosion. (Capability unit IIe–1; woodland group 4B)

Mecklenburg Series

The Mecklenburg series consists of moderately deep, gently sloping to strongly sloping, well-drained soils of the uplands. In the less eroded areas, the surface layer is commonly grayish-brown, friable loam. The subsoil is generally yellowish-red or strong-brown, firm clay. The bedrock consists chiefly of diorite, gabbro, and basalt. In most places it is at a depth of more than 3 feet.

These soils are near the Iredell, Davidson, Lloyd, and Wilkes soils. They are deeper, more friable, and redder than the Iredell soils. They are shallower over bedrock and less red than the Davidson and Lloyd soils, but they are firmer. The Mecklenburg soils are deeper and have a thicker, more strongly developed subsoil than the Wilkes soils.

The Mecklenburg soils are low to medium in natural fertility and in organic matter. They are medium acid to slightly acid. These soils have moderate to low available water capacity and moderately slow permeability.

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Most of the acreage of these soils is on the east side of the county near Elmwood and east of Mooresville. The less eroded and less sloping areas are suited to cotton, corn, small grains, lespedeza, and grasses grown for pasture. The soils are good for agriculture, and much of the acreage is cultivated or is used for pasture.

Mecklenburg loam, 2 to 6 percent slopes, eroded (MkB2).—This soil is mostly near Elmwood and east of Mooresville. It is gently sloping and is on ridges of the uplands. This well-drained soil has a surface layer of grayish-brown to reddish-brown, friable loam and a subsoil of olive-brown to red, firm clay.

The following describes a representative profile in a cultivated field, one-third mile east of Elmwood and 60 feet north of U.S. Highway No. 70:

A_p—0 to 7 inches, dark-brown (7.5YR 3/2) loam; weak, medium and fine, granular structure; friable; small fibrous roots are abundant in the uppermost 3 inches and plentiful in the lower 4 inches; slightly acid; abrupt, wavy boundary.

B_{21}—7 to 16 inches, yellowish-red (5YR 5/6) clay; moderate, medium and fine, subangular blocky structure; firm; distinct, continuous, medium clay films; a few, small, fibrous roots; black streaks around old root channels; a few, small iron concretions; a few quartz pebbles, 3 millimeters in diameter; slightly acid; clear, smooth boundary.

B_{22}—16 to 25 inches, yellowish-red (5YR 5/6) clay; common, fine, distinct mottles of light olive brown (2.5Y 5/6) and common, medium, prominent mottles of red (2.5 YR 4/6); moderate, medium and fine, subangular and angular blocky structure; firm; prominent, continuous, medium clay films; a few, small, fibrous roots; common iron concretions as much as 5 millimeters in diameter; a few quartz fragments as large as ¾ inch in diameter; slightly acid; clear, smooth boundary.

B_3—25 to 28 inches, red (2.5YR 4/6) clay; common, medium, distinct mottles of light olive brown (2.5YR 4/6); moderate, medium, subangular and angular blocky structure; firm; distinct, discontinuous, medium clay films; pockets of weathered parent material; a few quartz pebbles as much as ½ inch in diameter; common, coarse, iron concretions as large as 5 millimeters in diameter; slightly acid; clear, smooth boundary.

C—28 to 33 inches +, mottled red, dark-brown, and strong-brown clay loam that contains dark-colored, partly disintegrated minerals; massive.

The A horizon ranges from grayish brown to reddish brown in color and from 3 to 8 inches in thickness. The B horizon is olive brown to red and is 12 to 34 inches thick. The A and B horizons combined generally range from 20 to 30 inches in thickness.

In some places black or brown iron concretions are in the A and B horizons. In many small areas the soil is severely eroded and the texture of the surface layer is clay loam. A few areas are not eroded or are only slightly eroded, and a few are severely eroded. In a few areas there are pebbles or stones that interfere with tillage. The slope is less than 2 percent in a few areas.

Mecklenburg loam, 2 to 6 percent slopes, eroded, is low to medium in fertility and in organic matter. This soil is medium to slightly acid. It has moderately low available water capacity and moderately slow permeability. Crops on this soil respond well if lime and fertilizer are added.

This soil is suited to row crops, small grains, pasture, and hay crops, and it is also suited to trees. Much of the acreage is in forests consisting of old growth or of

areas that have been cut over, but some is cultivated or is used for pasture. If this soil is cultivated, practices are required to protect it from further erosion. (Capability unit IIe–3; woodland group 5A)

Mecklenburg loam, 6 to 10 percent slopes, eroded (MkC2).—This soil is steeper than Mecklenburg loam, 2 to 6 percent slopes, eroded. The surface layer is generally reddish brown to yellowish brown and is 3 to 8 inches thick.

In many small areas the soil is severely eroded and the surface layer is clay loam. There are a few gullies, and some of them are deep. In some areas the soil is not eroded or is only slightly eroded. The soil contains black or brown iron concretions in some places. Stones or pebbles interfere with tillage in a few areas.

This soil is suited to row crops, small grains, pasture, and hay crops, and it is also suited to trees. Much of it is cultivated or in pasture, but some of it has good stands of shortleaf and Virginia pines. If this soil is cultivated, intensive practices are required to protect it from further erosion. (Capability unit IIIe–3; woodland group 5A)

Mecklenburg loam, 10 to 15 percent slopes, eroded (MkD2).—This soil is shallower over bedrock than Mecklenburg loam, 2 to 6 percent slopes, eroded, and it also has stronger slopes and a thinner surface layer. The surface layer is commonly reddish brown to yellowish brown and is 3 to 5 inches thick.

In many small areas the soil is severely eroded and the texture of the surface layer is clay loam. There are a few gullies, and some of them are deep. In a few areas the soil is not eroded or is only slightly eroded. In some places there are black or brown iron concretions. Stones or pebbles interfere with tillage in a few areas.

This soil is suited to row crops, small grains, hay, and pasture, and it is also suited to trees. All of it has been cleared at some time, but some of it has reseeded to shortleaf and Virginia pines. If this soil is cultivated, intensive practices are needed to protect it from further erosion. (Capability unit IVe–3; woodland group 5A)

Mecklenburg clay loam, 6 to 15 percent slopes, severely eroded (MhD3).—This soil is generally on side slopes in all parts of the county where there are other Mecklenburg soils. It has a finer texture and stronger slopes than Mecklenburg loam, 2 to 6 percent slopes, eroded. Its surface layer is thinner, and generally the entire profile is thinner. The surface layer is clay loam to a depth of 4 to 6 inches. It consists mostly of material from the former subsoil that has been mixed with the remaining soil material from the original surface layer. In places as much as 25 percent of the acreage is made up of shallow gullies.

Mecklenburg clay loam, 6 to 15 percent slopes, severely eroded, is droughty, has poor tilth, and takes in water slowly. It is difficult to till because it can be worked only within a narrow range of moisture content. Because of the fine texture of the surface layer, the surface puddles and crusts after a hard rain. It is, therefore, hard to obtain a good stand of the crops that are grown.

This soil is suited to corn and small grains and to hay and pasture crops. Much of the acreage has a cover of broomsedge, briers, honeysuckle, and a scattering of young trees, but some areas have reseeded to shortleaf and Virginia pines. If this soil is cultivated, intensive practices are required to protect it from further erosion. (Capability unit IVe–3; woodland group 5B)

Mixed Alluvial Land

Mixed alluvial land consists of areas of unconsolidated alluvium recently deposited by streams. It is made up of various kinds of alluvial material. In Iredell County this land type is mapped in two units, according to drainage. One of the units is poorly drained; the other is moderately well drained to excessively drained.

Mixed alluvial land, wet (Mn).—This nearly level miscellaneous land type is generally on narrow first bottoms adjacent to streams that have narrow channels. It is subject to frequent overflow and consists of recent alluvium washed from soils of uplands and terraces. No profile has developed in the areas, and in most places the soil material is stratified. The color ranges from grayish brown to black, and the texture, from loamy fine sand through silt loam. The texture varies within short distances, but in most places the soil material is a mixture of textures. In some places this land type has an overwash of local alluvium and colluvium.

Mixed alluvial land, wet, is near the Chewacla and Wehadkee soils. It is generally more poorly drained and has more sand throughout than the Chewacla soils, and it contains more organic material and is subject to more frequent overflow. Mixed alluvial land, wet, has a wider range of drainage and more sand throughout than the Wehadkee soils, and it is subject to more frequent overflow. In contrast to the Chewacla and Wehadkee soils, it lacks profile development.

Internal drainage ranges from somewhat poor through very poor in this land type. The water table is high much of the year. Generally, this unit is high in organic matter.

If Mixed alluvial land, wet, is drained, it can be used to grow corn, sorghum, and pasture grasses that are suited to the area. It is not important for agriculture, and most of it has a cover of bog rushes, willows, and alders. (Capability unit IVw–1; woodland group 2)

Mixed alluvial land (Mm).—This nearly level miscellaneous land type is on narrow to wide first bottoms adjacent to streams. It is subject to overflow and consists of recent alluvium washed from soils of uplands and terraces. The soil material has no profile development, and in most places it is stratified. Its color ranges from light gray to yellowish brown, and its texture, from loamy fine sand through silt loam. The texture varies within short distances, and in most places the material is a mixture of textures.

This land type is near the Buncombe, Congaree, and Chewacla soils. It contains less sand and has a wider range of drainage than the Buncombe soils, and it is generally in areas that are subject to more frequent overflow than are the Congaree and Chewacla soils. Mixed alluvial land contains more sand and has a wider range of drainage than the Congaree and Chewacla soils, and it has no profile development. Also, it is generally better drained than the Chewacla soils.

Mixed alluvial land is droughty and low in fertility. The acreage is small, and the land is not important for agriculture.

If this land type is properly fertilized and managed, it can be used for corn, sorghum, and pasture grasses that are suited to the area. Most of the acreage is cultivated or in pasture, but some is in trees. (Capability unit IIw 1; woodland group 1)

Moderately Gullied Land

Moderately gullied land is land that has been largely cut by shallow gullies. It is mapped in two units in Iredell County. One of the units is rolling, and the other is hilly.

Moderately gullied land, rolling (MoC).—This miscellaneous land type is in most parts of the county, but it is mostly in the southern part. It is well drained and is made up of gullied areas of yellowish-red, red, or dark-red soils of the uplands. More than one quarter of the land has been cut by shallow gullies. In many places the soil material between the gullies consists mainly of original surface soil. The gullies can be crossed by tillage equipment, but the equipment does not obliterate them.

Moderately gullied land, rolling, is low in fertility. It has rapid runoff.

Most of this land type has been cultivated, and poor tillage practices have allowed gully erosion. The areas can be reclaimed for pasture if the gullies are filled in and protected to prevent further gullying, if fertilizer is added, and if other practices are used to help control erosion. Areas that are in pines or that are to be planted to pines should be seeded to grasses that will form a close-growing sod. Most of the acreage is in Virginia pines, but some is in pasture or is idle. (Capability unit VIIe–2; woodland group 9)

Moderately gullied land, hilly (MoD).—This miscellaneous land type is in most parts of the county, but it is mainly in the southern part. It is well drained and is made up of gullied areas of yellowish-red, red, or dark-red soils of the uplands. More than one-quarter of the land has been cut by shallow gullies. In many places the soil material between the gullies consists mainly of material from the original surface soil. The gullies can be crossed by tillage equipment, but the equipment does not obliterate them.

Moderately gullied land, hilly, is low in fertility. Runoff is rapid.

This land type is not important for agriculture. Most of it has been cultivated or used for pasture; poor tillage practices and lack of protection have allowed gully erosion. This land is suited to trees. A close-growing sod should be used to protect bare areas and to keep the gullies from extending or deepening. The sod will also help to reduce the silting of streams. Most of the acreage is now in Virginia pines, but some is idle or in pasture of low quality. (Capability unit VIIe–2; woodland group 9)

Roanoke Series

The Roanoke series is made up of nearly level, poorly drained soils that are shallow to moderately deep over old, sandy alluvium. The soils are on low terraces along the major streams. Their surface layer is very dark gray, dark grayish-brown, or light-gray, friable loam. In some places there is an overwash of coarser textured material. The subsoil is gray, very firm clay that has yellowish or reddish streaks and is 12 to 30 inches thick. It is generally underlain by sand or sandy clay.

In Iredell County the Roanoke soils are mapped only in undifferentiated units with the Warne soils. A profile of a Roanoke soil is described under Warne and Roanoke fine sandy loams in the Warne series.

Severely Gullied Land

Severely gullied land is land that has been cut by deep gullies. The land is not suitable for agriculture, and it consists of areas of soils that are too eroded to make it practical to reclaim them.

Severely gullied land (Sg).—This land type is mainly in the southern part of the county, but it is also in other parts. Practically all of the surface layer and most of the subsoil have been removed by gully erosion (fig. 8).

Figure 8.—**Areas of Severely gullied land; it is not practical to reclaim this land for crops or for pasture.**

In many places the gullies are deep, and some of the gullies have cut into the underlying weathered rock. The gullies are too deep to be crossed by tillage equipment.

Severely gullied land is low in fertility. Runoff is rapid.

This land type is not important for agriculture, and it is suited only to trees. In most places it supports a poor stand of Virginia pine, but in some places the areas are nearly bare. The gullies should be protected to keep them from extending into other areas. If the gullied areas are protected, the silting of streams will be reduced, and thus flooding and damage to wildlife will be reduced. Generally, either kudzu or honeysuckle can be planted to stabilize the gullies, but, if the sides of the gullies are steep, it is best to plant kudzu. (Capability unit VIIe–2; woodland group 9)

Starr Series

The Starr series consists of deep, gently sloping soils along drainageways, on toe slopes, and in depressions of

the uplands. The soils are well drained. Their surface layer is dark reddish-brown to dusky-red, friable loam. Their subsoil is red or dark-red, friable clay loam or silty clay loam. The parent material consists of deposits of local alluvium and colluvium washed from surrounding soils of the uplands. There is an overwash of recent deposits in many places.

These soils are near Local alluvial land, but they are redder and contain less sand than that land type. The soils are also near the Lloyd and Davidson soils, but they are not so well developed as the Lloyd and Davidson soils, and their subsoil contains less clay.

The Starr soils are medium in natural fertility and in organic matter. They are medium acid to strongly acid and are moderate in available water capacity and in permeability.

These soils are in all parts of the county, except in areas where light-colored, sandy soils predominate. They are good for agriculture, but their acreage is small. The soils are suited to row crops, small grains, hay, and pasture. Most of the acreage, however, is used like the surrounding soils because the areas are small. Some areas of these soils are used for crops and pasture, and others are in forests of hardwood or pine.

Starr loam (St).—This is the only Starr soil mapped in this county. It is a well-drained, gently sloping soil of the upland slopes and depressions. Its A horizon is dark reddish-brown to dusky-red, friable loam. Its B horizon is dark-red or red, friable clay loam or silty clay loam.

The following describes a representative profile in a cultivated field, one-fourth mile north of Hurst Turner American Legion Post, 175 yards west on a farm road, and 15 feet north of the road:

A_p—0 to 8 inches, dusky-red (2.5YR 3/2) loam; weak, coarse, granular structure; friable or very friable; a few, small, fibrous roots; slightly acid; abrupt, smooth boundary.

B_1—8 to 13 inches, dark reddish-brown (2.5YR 3/4) loam; weak, medium, subangular blocky structure; friable; a few, small, fibrous roots; slightly acid; clear, wavy boundary.

B_{21}—13 to 24 inches, dark-red (2.5YR 3/6) clay loam; weak, fine and medium, subangular blocky structure; friable; a few, thin, discontinuous clay films; a few, small, fibrous roots; a few, medium, decayed, woody roots; a few, small, rounded fragments of basic rock that are less than 3 millimeters in diameter; medium acid; gradual, wavy boundary.

B_{22}—24 to 43 inches, dark-red (2.5YR 3/6) clay loam; weak, medium, subangular blocky structure; friable; a few, distinct clay films around mineral fragments; a few, small, fibrous roots; some partly weathered fragments of basic rock; a few, round pebbles that are as much as 10 millimeters in diameter; strongly acid; there is a weathered stone line at the lower boundary; clear, wavy boundary.

B_{23b}—43 to 58 inches +, dark-red (2.5YR 3/6) clay; moderate, medium, subangular blocky structure; friable; thin distinct, mainly discontinuous clay films that are continuous on some vertical faces of peds; a few, small, fibrous roots; strongly acid.

The A horizon ranges from dark brown to dusky red in color and from 6 to 18 inches in thickness. The B horizon is red or dark red and is 18 to 30 inches or more thick. In some places the surface layer is fine sandy loam. In a few places the slope is less than 2 percent, but in a few other places it is greater than 6 percent.

Starr loam is medium in natural fertility and in organic matter. It is medium acid to strongly acid and has moderate available water capacity and permeability.

This soil is suited to row crops, small grains, hay, and pasture. The areas are small, and most of the acreage is used like the surrounding soils. Some areas are cultivated or in pasture. Other areas are in forests made up of hardwoods or of shortleaf and Virginia pines. (Capability unit IIe–2; woodland group 1)

Warne Series

The Warne series is made up of deep, nearly level, somewhat poorly drained soils of low stream terraces. The soils have a surface layer of very dark gray to dark grayish-brown, friable fine sandy loam. Their subsoil is yellowish-brown and light olive-brown to olive-gray, very firm clay that is very plastic when wet and hard when dry. Gray mottling occurs in the upper part of the subsoil. The parent material consists of old deposits of alluvium.

These soils are near the Altavista and Wehadkee soils. They are darker colored and are less well drained than the Altavista soils, and they are more plastic and have more mottling in the upper part of the subsoil. They are better developed, are in higher positions, and contain more clay than the Wehadkee soils.

The Warne soils are low to medium in fertility and in organic matter. They are strongly acid to very strongly acid and have low available water capacity and slow permeability.

These soils are not important for agriculture, because their acreage is small and they are suited to only a few kinds of crops. They can be used for pasture, hay, trees, and a few kinds of row crops. These soils are difficult to drain, but drainage is necessary if some crops are to be grown. Most of the acreage has been cleared and is used for pasture.

In Iredell County the Warne soils are mapped only in an undifferentiated mapping unit with the Roanoke soils. The soils are mapped together because the acreage is small, they occur in similar positions, and they are used and managed the same.

Warne and Roanoke fine sandy loams (Wa).—These are the only Warne and Roanoke soils mapped in the county. They are on low terraces along the major streams. About 65 percent of this unit consists of Warne soils, and about 35 percent, of Roanoke. The soils are nearly level and are deep to shallow over old alluvium. They are somewhat poorly drained or poorly drained. The A horizon is grayish, friable fine sandy loam or loam, and the B horizon is very firm clay.

The following describes a representative profile of a Warne soil in a pasture, one eighth mile north of Fourth Creek along Bell Road, 850 feet west of the road:

A_p—0 to 4 inches, very dark gray (10YR 3/1) fine sandy loam; weak, fine, granular structure; very friable; abundant, small, fibrous roots; a few ant channels; neutral; clear, wavy boundary.

A_2—4 to 8 inches, pale-yellow (5Y 7/4) fine sandy loam; weak, medium, granular structure; very friable; plentiful, small, fibrous roots; a few ant channels; very slightly acid; gradual, wavy boundary.

B_1—8 to 12 inches, light olive-brown (2.5Y 5/6) clay loam; moderate, medium and fine, subangular blocky structure; friable; distinct, discontinuous clay films; a few, small fibrous roots; strongly acid; clear, wavy boundary.

B_{21}—12 to 18 inches, light olive-brown (2.5Y 5/4) clay; common, fine, distinct mottles of strong brown (7.5YR 5/8); strong, medium subangular blocky structure; firm; distinct, continuous clay films; a few, small fibrous roots; very strongly acid; clear, wavy boundary.

B_{22}—18 to 23 inches, light olive-gray to olive-gray (5Y 6/2 to 5/2) clay; common, fine, distinct mottles of yellowish brown (10YR 5/8); strong, medium, subangular blocky structure; firm to very firm; distinct, continuous clay films; a few, small, fibrous roots; very strongly acid; clear, wavy boundary.

B_{23}—23 to 33 inches, light olive-gray (5Y 6/2) clay; common, fine, distinct mottles of yellowish brown (10YR 5/8); a few, fine, prominent mottles of red (2.5YR 4/8); weak, fine, subangular and angular blocky structure; very firm; a few, distinct, discontinuous clay films; a few, small, decayed, woody roots; very strongly acid; clear, wavy boundary.

B_3—33 to 38 inches, gray (2.5Y 5/0) clay; common, medium, distinct mottles of brownish yellow (10YR 6/8); a few, fine, prominent mottles of red (2.5YR 4/8); weak, medium, angular blocky structure that approaches massive; very firm; a few, distinct, discontinuous clay films; a few, rounded grains of sand that are as much as 2 millimeters in diameter; very strongly acid; gradual, wavy boundary.

C_1—38 to 46 inches, gray (2.5Y 5/0) clay; a few mottles of brownish yellow; common pockets of sandy clay; massive; firm; clear, smooth boundary.

C_2—46 to 56 inches +, gray sandy clay; common mottles of yellowish brown; massive; friable; a few rounded grains of sand that are about 1 millimeter in diameter.

The following describes a representative profile of a Roanoke soil in a pasture, one-eighth mile north of Fourth Creek along Bell Road, 850 feet west-northwest of the road:

A_p—0 to 4 inches, dark grayish-brown (2.5Y 4/2) loam; moderate, coarse, granular structure; friable; abundant, small, fibrous roots; slightly acid; clear, wavy boundary.

B_1—4 to 7 inches, gray (10YR 5/1) clay; many, medium, distinct mottles of yellowish brown (10YR 5/8); moderate, medium, subangular blocky structure; firm; prominent, continuous clay films; plentiful, small, fibrous roots; very strongly acid; clear, wavy boundary.

B_{21}—7 to 21 inches, gray (5Y 5/1) clay; common, medium, distinct mottles of yellowish brown (10YR 5/8); moderate, coarse, subangular blocky structure that breaks toward prismatic; very firm; prominent continuous clay films; a few, small, woody, fibrous roots; very strongly acid; gradual, wavy boundary.

B_{22}—21 to 30 inches, gray (2.5Y 5/8) clay; common, medium, distinct mottles of yellowish brown (10YR 5/8); weak, coarse, subangular blocky structure; very firm; sticky when wet; a few, distinct, discontinuous clay films; a few, small, woody, fibrous roots; very strongly acid; clear, wavy boundary.

B_3—30 to 34 inches, gray (2.5Y 5/0) clay; common, medium, distinct mottles of yellowish brown (10YR 5/8); weak, medium, subangular blocky structure to massive; very firm; a few, distinct, discontinuous clay films; a few, small, decayed, woody roots; very strongly acid; gradual, wavy boundary.

C_1—34 to 55 inches, gray clay; a few, fine, distinct mottles of brownish yellow; massive; very firm; a few, small, decayed, woody roots; gradual, wavy boundary.

C_2—55 to 91 inches +, gray sandy clay mottled with yellowish brown, brownish yellow, and blue; massive; friable.

The A horizon of these soils ranges from very dark gray or dark grayish brown to light gray in color, and from 3 to 12 inches in thickness. The B horizon is gray to light olive brown and ranges from 12 to 30 inches in thickness. In some areas the slope is greater than 2 percent.

Warne and Roanoke fine sandy loams are low to medium in fertility and in organic matter. They are strongly acid and have low available water capacity and slow permeability.

If these soils were drained, they could be used for pasture, hay, trees, and some row crops. Draining them would be difficult, however, and drainage would be required for most crops. Most of the acreage has been cleared and is used for pasture. (Capability unit IIIw–2; woodland group 2)

Wehadkee Series

The Wehadkee series consists of nearly level, poorly drained soils of first bottoms. In places the surface layer is grayish-brown to dark-brown, friable silt loam, but in most places it is dark-brown silt loam. In some places the soil material below the surface layer varies in color and is friable and stratified. In other places it consists of gray clay that is compact and massive. Gray mottling occurs throughout the profile. The parent material is made up of recent alluvium laid down by streams.

These soils are near the Congaree and Chewacla soils. They are less well drained and have a duller, darker color throughout the profile than the Congaree soils, and they contain more clay and organic matter. They are not so well drained as the Chewacla soils, have mottles higher in the profile, are grayer throughout, and generally contain more clay and organic matter.

The Wehadkee soils are medium to low in fertility and are medium to high in organic matter. They are medium acid to strongly acid and have moderate to slow permeability. These soils are subject to frequent overflow.

These soils are not important for agriculture. The water table is high and causes the soils to be swampy in wet seasons. If the soils are adequately drained, they can be used for pasture and hay crops. It is difficult and generally impractical, however, to install a drainage system. These soils generally have a cover of willows and alders, but, in areas that have been cleared, the cover is bog rush and marsh grasses.

Wehadkee silt loam (We).—This is the only Wehadkee soil mapped in the county. It is on first bottoms of small and large streams where it is subject to frequent overflow. The A horizon is dark-colored, friable silt loam. The C horizon is variable in color, texture, and consistence. Mottling occurs throughout the profile.

The following describes a representative profile in a pasture, 200 yards east of Bell Road, 100 yards south of Fourth Creek:

A_p—0 to 6 inches, brown (10YR 5/3) silt loam; common, medium, distinct mottles of light olive gray (5Y 6/2); weak, fine, granular structure; friable; abundant, fine, fibrous roots; medium acid; clear, smooth boundary.

C_1—6 to 13 inches, mottled, brown (10Y 5/3) and light olive-gray (5Y 6/2) silty clay loam; massive; friable; plentiful, small, fibrous roots; strongly acid; clear, smooth boundary.

C_2—13 to 26 inches +, light-gray (2.5Y 7/0) sandy clay; common, fine, prominent mottles of strong brown (7.5YR 5/6); massive; firm; a few, small, fibrous roots; the water table is at a depth of 26 inches; strongly acid.

The A horizon ranges from grayish brown to dark brown in color and from 4 to 8 inches in thickness. The C horizon is friable and stratified in places. In other places it is compact and massive and its color ranges from mottled gray and brown to solid gray. The profile is generally more than 36 inches thick. Depth of the water table varies greatly with the season.

In some places the surface layer is loam, and in other places it is fine sandy loam.

Wehadkee silt loam is medium to low in fertility and is medium to high in organic matter. It is medium acid to strongly acid and has moderate to slow permeability.

This soil is not important for agriculture. The water table is high and causes the soil to be swampy in wet seasons. If the soil is adequately drained, it can be used for pasture and hay crops that are suited to the area. It is difficult and generally impractical, however, to install a drainage system. Most of the acreage has a cover of willows and alders, but in areas that have been cleared the cover is bog rush and marsh grasses. (Capability unit IVw-1; woodland group 2)

Wickham Series

The Wickham series consists of deep, nearly level to sloping, well-drained soils of stream terraces. The surface layer is brownish-gray to dark-brown, friable fine sandy loam and is 3 to 10 inches thick. The subsoil is reddish-brown to yellowish-red, friable clay loam or clay and is 30 to 40 inches thick. There is a layer of rounded stones just below the subsoil in many places (fig. 9). The parent material consists of old deposits of alluvial material.

These soils are near the Hiwassee and Altavista soils. They have a lighter colored, coarser textured surface layer than the Hiwassee soils, and their subsoil is lighter red and contains less clay. The surface layer of the Wickham soils is browner than that of the Altavista soils, and their subsoil is redder and is better drained.

The Wickham soils are low in natural fertility and in organic matter. They are medium acid and have moderate available water capacity and moderate permeability.

Figure 9.—Stone line under a Wickham fine sandy loam.

These soils are important locally, but they occupy only a small acreage. They are suited to many different crops and are easy to till. Most of the acreage is cultivated or in pasture, but some of it is in forest.

Wickham fine sandy loam, 2 to 6 percent slopes, eroded (WfB2). This gently sloping, well-drained soil is on terraces along the major streams. The A horizon is brownish-gray to dark-brown, friable fine sandy loam. The B horizon is reddish-brown to yellowish-red, friable clay loam or clay.

The following describes a representative profile in a pasture, ¾ mile north of Union Arbor, ⅝ mile west on a gravel road and across Rocky Creek, and 150 yards north of the road:

A_p—0 to 4 inches, dark-brown (10YR 3/3) fine sandy loam; weak, fine, granular structure; friable; plentiful, small, fibrous roots; a few, small, water-rounded pebbles on the surface; slightly acid; abrupt, wavy boundary.

B_1—4 to 9 inches, yellowish-red (5YR 4/6) sandy clay loam; weak, medium, subangular blocky structure; friable; plentiful, small, fibrous roots; a few, finely divided mica flakes; slightly acid; gradual, wavy boundary.

B_{21}—9 to 32 inches, yellowish-red (5YR 4/6) clay loam; moderate, medium, subangular blocky structure; friable; distinct, discontinuous clay films; plentiful, small, fibrous roots in the upper part of this horizon, and a few, small, fibrous roots in the lower part; a few, water-rounded pebbles that are mostly less than 1 inch in diameter; a few, fine mica flakes; medium acid; clear wavy boundary.

B_{22}—32 to 39 inches, yellowish-red (5YR 5/8) clay loam; weak, medium, subangular blocky structure; friable; a few, thin, distinct, discontinuous clay films; a few, small, fibrous roots; a few, water-rounded pebbles that are less than 10 millimeters in diameter; strongly acid; clear, wavy boundary.

B_3—39 to 43 inches, strong-brown (7.5YR 4/6) sandy clay loam; a few, fine, faint mottles of yellowish red (5 YR 4/8); weak, medium, subangular blocky structure; friable; a few, thin, distinct, discontinuous clay films; a few, small, fibrous roots; a few, water-rounded pebbles that are 3 to 5 millimeters in diameter; a few pockets of partly disintegrated minerals; a few, fine mica flakes; very strongly acid; clear, wavy boundary.

C—43 to 48 inches, yellow sandy clay loam mottled with yellowish red; massive; friable; weathered parent material is common.

The A horizon ranges from yellowish brown to dark brown in color and from 3 to 10 inches in thickness. The B horizon is reddish brown to yellowish red and is 30 to 40 inches thick. The A and B horizons combined are generally more than 36 inches thick.

In a few areas the surface layer is loam. In small areas the soil is severely eroded and the surface layer is reddish clay loam. In some areas there are rounded stones or pebbles on the surface.

Wickham fine sandy loam, 2 to 6 percent slopes, eroded, is low in natural fertility and in organic matter. It is medium acid to strongly acid and has moderate available water capacity and moderate permeability. Crops grown on this soil respond well if lime and fertilizer are added.

This soil is good for agriculture, but its acreage is small. It is suited to row crops, especially tobacco, and to small grains, hay, pasture, and trees. Most of the acreage is cultivated or in pasture. If this soil is cultivated, practices ought to be applied to protect it from erosion. (Capability unit IIe–1; woodland group 4B)

Wickham fine sandy loam, 2 to 6 percent slopes (WfB).—This soil has a thicker surface layer than Wickham fine sandy loam, 2 to 6 percent slopes, eroded. In some places there are rounded stones or pebbles on the surface. In a few areas the soil has a surface layer of loam. The slope is less than 2 percent in a few areas.

Wickham fine sandy loam, 2 to 6 percent slopes, is suited to row crops, especially tobacco. It is also suited to small grains, hay, pasture, and trees. Much of the acreage is cultivated or in pasture, but some of it is in trees. If this soil is cultivated, practices ought to be applied to protect it from erosion. (Capability unit IIe 1; woodland group 4A)

Wickham fine sandy loam, 6 to 10 percent slopes, eroded (WfC2). This soil has stronger slopes than Wickham fine sandy loam, 2 to 6 percent slopes, eroded. In some areas there are rounded stones or pebbles on the surface. In a few areas the soil has a surface layer of loam. In small areas the soil is severely eroded and the surface layer is reddish clay loam. In some places the soil is not eroded or is only slightly eroded. The slope is greater than 10 percent in small areas.

Wickham fine sandy loam, 6 to 10 percent slopes, eroded, is suited to row crops, especially tobacco. It is also suited to small grains, hay, pasture, and trees. Most of the acreage is cultivated or in pasture, but some of it is in forest. If this soil is cultivated, intensive practices ought to be applied to protect it from further erosion. (Capability unit IIIe–1; woodland group 4B)

Wilkes Series

The Wilkes series consists of sloping to steep, well-drained soils of the uplands. The soils are shallow over bedrock. Their surface layer is dark grayish-brown to light olive-brown, friable fine sandy loam to clay loam. Their subsoil is thin and discontinuous or is lacking. It is olive-yellow to yellowish-brown, very firm, plastic clay, firm sandy clay, or friable fine sandy loam. In most places the bedrock of basic, or mixed acidic and basic, igneous and metamorphic rocks, is at a depth of less than 6 feet, and in many places it is at a depth no greater than 2 feet.

These soils are near the Lloyd, Mecklenburg, and Iredell soils. They are less deep and less red than the Lloyd and Mecklenburg soils, and their profile is less well developed. Their subsoil is less well developed and is not so deep as that of the Iredell soils. The Wilkes soils, like the Louisburg and Louisa soils, have a profile that is shallow over bedrock. They also have a thin, discontinuous subsoil, and in places a developed subsoil is lacking. They are darker gray, however, than the Louisburg soils, are not so deep, and contain less sand. Also, they are not so red as the Louisa soils and contain less mica.

The Wilkes soils are low to medium in natural fertility and in organic matter. They are slightly acid to medium acid. Because the subsurface layer is variable in texture, these soils are low to moderate in available water capacity and are slow to rapid in permeability.

These soils are in all parts of the county. They are not important for agriculture, because they are suited to only a few different crops. Most of the acreage is in forest, but some is used for pasture and hay, and a small acreage is used for row crops.

Wilkes soils, 6 to 10 percent slopes (WkC).—These soils are generally on ridges in rolling and broken areas of the uplands. They occur mainly where basic rocks predominate. The soils are well drained and are shallow over bedrock. Their A horizon is dark grayish-brown to light olive-brown, friable fine sandy loam to clay loam. Their B horizon is thin, discontinuous, olive-yellow to yellowish-brown, very firm, plastic clay; firm sandy clay; or friable fine sandy loam. In places the subsoil is lacking.

The following describes a representative profile in a hayfield, 1.4 miles south of Mt. Vernon Church, 0.4 mile east on a private road to a farmhouse, and 90 yards north of the house:

A_p—0 to 4 inches, olive-brown (2.5 Y 4/4) sandy clay loam; moderate, coarse, granular structure; friable; plentiful grass roots; a few grains of quartz that are as much as 3 millimeters in diameter; a few, finely divided mica flakes; green specks and green fragments that are as much as 3 millimeters in diameter; very slightly acid; abrupt, smooth boundary.

BC—4 to 8 inches, yellowish-brown (10YR 5/6) clay; large blocky structure that breaks to weak, medium, subangular blocks; firm; a few grass roots; a few, finely divided mica flakes; prominent, discontinuous clay films along vertical cracks; a few grains of quartz that are as much as 3 millimeters in diameter; common, green, yellow, and black, partly weathered minerals; a few, green and black fragments of rock that are as much as 2 inches in diameter; very slightly acid; clear, wavy boundary.

C—8 to 12 inches +, yellowish-brown clay loam that contains large amounts of green and black, disintegrated rock; a few clay films in vertical cracks in the weathered parent material; massive.

The A horizon ranges from dark grayish brown to light olive brown in color and from 4 to 8 inches in thickness. The B horizon, if present, is olive yellow to yellowish brown, and in most places it is less than 6 inches thick. The profile generally is less than 24 inches thick.

In a few areas the slope is less than 6 percent. In small areas there are stones and pebbles within the areas. The soils are moderately eroded in a few areas.

The Wilkes soils in this mapping unit are low to medium in natural fertility and in organic matter. The soils are slightly acid to medium acid. Because of the variable texture of the subsurface layer, they are low to moderate in available water capacity and are slow to rapid in permeability. Crops grown on these soils respond well to management.

These soils are suited to pasture and to lespedeza grown for hay. They are also suited to some row crops and to trees. Most of the acreage is in forest, but some of it is in pasture or is cultivated. If these soils are cultivated, intensive practices are required to protect them from erosion. (Capability unit IVe–3; woodland group 6)

Wilkes soils, 10 to 15 percent slopes (WkD).—These soils are generally on slopes that border drainageways. They have stronger slopes than Wilkes soils, 6 to 10 percent slopes.

In small areas there are stones, pebbles, and a few rock outcrops. In some places the soils are moderately eroded.

Some areas of Wilkes soils, 10 to 15 percent slopes, are in pines or in hardwoods of low quality. Other areas have been cleared and are used for pasture, hay crops, and a few row crops. If the soils are cultivated, intensive practices

are required to protect them from erosion. (Capability unit VIe–3; woodland group 6)

Wilkes soils, 15 to 25 percent slopes (WkE).—These soils are generally on side slopes that border deeply cut drainageways or are in areas of broken topography. They are shallower over bedrock than Wilkes soils, 6 to 10 percent slopes, and they have stronger slopes and generally have no B horizon. In places there are rock outcrops, stones, and pebbles. In some places the soils are moderately eroded.

All of the acreage in Wilkes soils, 15 to 25 percent slopes, is best used for trees. The soils are not suited to row crops, because they are highly susceptible to erosion. Some of the acreage has a cover of pines and of hardwoods of low quality. (Capibility unit VIIe–1; woodland group 6)

Wilkes soils, 25 to 55 percent slopes (WkF).—These soils are on steep slopes that border the major drainageways or are in parts of the county where the areas are steep and broken. They are shallower over bedrock and are steeper than Wilkes soils, 6 to 10 percent slopes. Generally, they have no B horizon. In places rock outcrops and stones or pebbles are within the areas.

All of the acreage in Wilkes soils, 25 to 55 percent slopes, is best used for trees. The soils have a cover of shortleaf and Virginia pines and of hardwoods of low quality. (Capability unit VIIe–1; woodland group 6)

Worsham Series

The Worsham series consists of gently sloping, deep to shallow soils that are poorly drained. The soils are on foot slopes in the uplands. Their surface layer is light-gray to dark-gray, friable loam and is 8 to 18 inches thick. Their subsoil is mottled gray, yellow, and light-brown, firm or friable clay loam, sandy clay loam, or sandy clay and is 6 to 30 inches thick. Generally, gray mottling occurs in the upper part of the subsoil and the gray color increases in the lower part, but in some places the soils are gray throughout. The parent material consists of material weathered from acidic rock or is local alluvium washed from the surrounding soils.

The Worsham soils are low in fertility and medium in organic matter. They are medium acid to strongly acid, have moderate available water capacity, and are moderate to moderately slow in permeability.

These soils are mostly near the Appling and Mayodan soils, but they are also near other soils of the uplands. They are less well drained than these other soils, have more gray in the profile, and generally occupy areas that receive seepage water from soils of the uplands. The Worsham soils are similar to the Colfax soils, but they are not so well drained and have more gray in the profile.

Because the acreage is small and these soils are suited to only a few crops, they are not important for agriculture. Corn, soybeans, and pasture crops can be grown if these soils are drained adequately.

Worsham loam (Wo).—This is the only Worsham soil mapped in the county. It is in small areas around the heads of springs, at the base of slopes, or in drainageways in uplands in all parts of the county. It is gently sloping and poorly drained. The A horizon is light-gray to dark grayish-brown, friable loam, but its texture ranges to sandy loam or silt loam. The B horizon is mottled gray, yellow, and light brown, firm or friable clay loam, sandy clay loam, or sandy clay.

The following describes a representative profile in an idle field, 0.3 mile north of Patterson Creek and 0.2 mile east of Jennings Road:

A_p—0 to 6 inches, dark grayish-brown (2.5Y 4/2) loam; weak, fine and medium, granular structure; friable; plentiful, small, fibrous roots; strong-brown coatings on old root channels; medium acid; clear, smooth boundary.

B_1—6 to 11 inches, gray (5Y 6/1) sandy clay loam; common, fine, prominent mottles of brownish yellow (10YR 6/6); weak, medium, granular structure that breaks to weak, medium, subangular blocky; friable, a few, small, fibrous roots; medium acid; clear, smooth boundary.

B_{21}—11 to 18 inches, light-gray (5Y 7/1) sandy clay; common, fine, prominent mottles of brownish yellow (10YR 6/6); moderate, coarse, subangular blocky structure that breaks to massive; friable; a few, thin, distinct, discontinuous clay films that are mostly on the faces of vertical peds; a few, small, fibrous roots; a few, small pebbles that are 2 to 3 millimeters in diameter; medium acid; abrupt, wavy boundary.

B_{22g}—18 to 43 inches, light-gray (5Y 7/1) clay; common, fine, prominent mottles of brownish yellow (10YR 6/6); moderate, coarse, subangular blocky structure that breaks to massive; firm; a few, thin, distinct, discontinuous clay films on the faces of vertical peds; a few, small, fibrous roots; medium acid; clear, wavy boundary.

C—43 to 50 inches +, blue clay; a few, fine, distinct mottles of strong brown; massive; firm.

The A horizon ranges from light gray to dark grayish brown in color, from loam to silt loam or sandy loam in texture, and from 8 to 18 inches in thickness. The B horizon generally is mottled gray, yellow, and light brown and is 6 to 30 inches thick. Gray mottling commonly occurs in the upper part of the B horizon. The gray color increases in the lower part of the profile, but in places the soil is gray throughout. In some areas the slope is less than 2 percent, and in others it is greater than 6 percent.

Worsham loam is low in fertility and medium in organic matter. It is medium acid to strongly acid, has moderate available water capacity, and is moderate to moderately slow in permeability.

Much of this soil is in mixed hardwoods. Areas that have been cleared but not cultivated have a cover of briers and bog rush. If this soil is drained adequately, it can be used for corn, soybeans, and pasture. (Capability unit IVw–2; woodland group 2)

Formation and Classification of Soils

In this section the factors of soil formation are described and the way these factors have affected the formation of soils in Iredell County is discussed. Then the classification of the soils is explained, and the great soil groups and the soil series in these groups are described.

Factors of Soil Formation

Soil is formed by the combined effects of parent material, climate, plant and animal life, relief, and time. The nature of the soil at any point on the earth depends

upon the particular combination of these five environmental factors at that point. All five of these factors affect the formation of every soil. The relative importance of each differs from place to place; sometimes one is more important and sometimes another. In many places one or two of the factors may dominate in the formation of a soil and fix most of its properties, but in every place the way the five factors have combined in the past determines the present characteristics of the soil (*9*, *11*).

Parent material

Parent material is the unconsolidated mass from which a soil forms. It is largely responsible for the chemical and mineralogical composition of the soils. The parent material of most of the soils in Iredell County is residual; that is, the soils have formed in place, in material derived through weathering of the underlying rock. The rocks underlying the county are primarily schist, gneiss, granite, and diorite (*13*). In this county the differences among the soils of the uplands were caused primarily by differences in the parent material and relief.

The soils along the larger streams in the county formed chiefly from alluvium, or material moved and deposited by streams. This alluvium was washed from soils of the uplands within the watershed. The soils on the first bottoms along these larger streams have a weakly developed profile, and some areas still have alluvial material deposited on them from time to time. The soils formed in local alluvium along the small streams and in drainageways have been only slightly modified by soil-forming processes. In contrast, the soils on terraces and on benches have been in place long enough to have developed soil horizons.

Climate

Climate affects the physical and chemical weathering and biological forces at work in the soils, primarily through the influences of precipitation and temperature. Water dissolves minerals, supports biological activity, and transports minerals and organic residues through the soil profile. The amount of water that percolates through the soil in a broad area depends mainly on the amount and intensity of rainfall, the infiltration rate of the soils, the plant cover, the relative humidity, and the length of the frost-free period. The amount of percolation downward is also affected by the physiographic position and by the permeability of the soil.

Temperature influences the kinds of organisms and their growth and the speed of physical and chemical reactions in the soils. Local variations in climate cause some characteristics of the soils to differ from those of soils developed under the prevailing climate of the region.

In Iredell County the soils are moist during a large part of the year and are subject to leaching much of the time. In summer, however, they are generally dry to moderately dry. They are generally frozen less than 10 days at a time in winter, and the depth of freezing is slight. Freezing and thawing in this county, therefore, have only a minor effect on weathering and on the formation of the soils.

Plant and animal life

The kinds and numbers of plants and animals that are on and in the soil are important in the development of soils. They are determined mainly by the climate and, to varying degrees, by the parent material, relief, and age of the soil. Bacteria, fungi, and other forms of microscopic life aid in weathering rock and decomposing organic matter. The large plants and animals alter the climate of the soil where they live. They furnish organic matter to the soil and transfer elements from the subsoil to the surface soil.

The activity of fungi and micro-organisms in the soils of this county is generally confined to the uppermost few inches of soil material. Earthworms and other small invertebrates carry on a slow, continual soil mixing, mostly in the A_1 horizon. Rodents do not appear to have had much effect on the formation of soils in this county.

Originally, Iredell County was covered by a forest made up mainly of oaks and hickories. In some areas windthrow of these trees has mixed the soil materials, but this mixing is generally not important in the formation of soils.

Relief

The relief of an area is largely determined by the geologic history of the region, including movement of the earth's crust, dissection by rivers and streams, and development of the landscape through retreat of slopes. Relief influences the formation of soils through its effect on the content of moisture, and on erosion, temperature, and plant cover. The influence of relief is modified by the other factors of soil formation.

In Iredell County slopes range from 0 to 55 percent. In the uplands the profiles are thick and well defined in the Cecil, Lloyd, and other soils that have slopes of less than 15 percent. Where slopes are steeper than 15 percent, the removal of soil material by geologic erosion is more rapid than on the less steep soils. As a result, many of the steep soils are shallow over bedrock and have a profile that has weakly defined horizons. Most of the soils that formed in alluvium are nearly level.

Time

The length of time that is required for a soil to develop depends on the other factors of soil formation. Less time is generally required for a soil to develop in a humid, warm region where the cover of vegetation is dense than in a dry, cold region where the vegetation is sparse. Under the same environment, less time is required for a soil to develop from coarse-textured parent material than from similar, but finer textured, parent material.

The ages of soils vary considerably. Old soils generally have better defined horizons than young soils. Generally, the soils in this county on the smoother parts of the uplands and on the old stream terraces have well-developed layers, or horizons. On the steep slopes, geologic erosion has removed soil material so rapidly that the soils are generally shallow over bedrock and have a less developed profile than in less sloping areas. On the first bottoms and in the small areas where local alluvium has accumulated, the soil material has been in place such a short time that the soils have not developed a mature profile.

Classification of the Soils

Because of the great number of soils and the differences among them, soils are grouped so that they can be more easily studied, their properties remembered, and their relationships seen (*12*). In the system of soil classification commonly used in the United States, soils are placed in four categories, or levels of classification (*9*, *11*). From the highest category to the lowest, these are the order, great soil group, series, and type.

In the highest category, the soils of the whole country are grouped into three orders, but in the lowest category there are thousands of soil types. Within a county, soils are classified in soil types and soil series, and the numbers of these categories are then grouped in great soil groups and soil orders. Several of the soils in Iredell County have some characteristics of two great soil groups and are regarded as intergrades rather than as being within the central concept of one or the other group.

In the highest category soils are classified into three soil orders—zonal, intrazonal, and azonal. The zonal order is made up of soils that have evident, genetically developed horizons that reflect the influence of climate and of plant and animal life in their formation. In Iredell County the Red-Yellow Podzolic soils and the Reddish-Brown Lateritic soils are the great soil groups in the zonal order.

The intrazonal order is made up of soils that have evident, genetically related horizons that reflect the influence of a local factor of relief or parent material over the effects of climate and plant and animal life. In Iredell County the Planosols and Low-Humic Gley soils are the great soil groups in the intrazonal order.

The azonal order is made up of soils that lack distinct, genetically developed horizons, because the soils are generally young, have parent material that is resistant to weathering, or have steep slopes. In Iredell County the Lithosols and Alluvial soils are the great soil groups in the azonal order.

More than 60 percent of the soils in Iredell County are within the central concept of the Red-Yellow Podzolic great soil group. In addition, almost 20 percent are Red-Yellow Podzolic soils that are intergrading toward Reddish-Brown Lateritic soils. More than 4 percent of the soils are Lithosols, or Lithosols intergrading toward Red-Yellow Podzolic soils. More than 6 percent are Alluvial soils. The rest of the soils in the county are Red-Yellow Podzolic soils that are intergrading toward Low-Humic Gley soils; Reddish-Brown Lateritic soils; Reddish-Brown Lateritic soils that are intergrading toward Planosols; Planosols; Low-Humic Gley soils; and Low-Humic Gley soils that are intergrading toward Planosols. Miscellaneous land types are not classified in great soil groups.

Table 9 lists the soil series by great soil groups and gives for each series some characteristics that are important in the formation of soils. A profile that is representative of each series is described in detail in the section "Descriptions of the Soils." Each great soil group is discussed in the following pages.

TABLE 9.—*Soil series classified in great soil groups and some factors of soil formation*

Great soil group and soil series	Brief profile description [1]	Position	Drainage	Slope	Parent Material
				Percent	
Red-Yellow Podzolic soils (central concept):					
Altavista	Light yellowish-brown fine sandy loam over brownish-yellow clay.	Terraces	Moderately good.	2–6	Old alluvium.
Appling	Light yellowish-brown sandy loam over yellowish-red clay.	Upland slopes and ridges.	Good	2–25	Material weathered from granite and granite gneiss.
Cecil	Dark grayish-brown and strong-brown fine sandy loam over red clay.	Upland slopes and ridges.	Good	2–45	Material weathered from granite gneiss and schist.
Madison	Very dark grayish-brown and yellowish-brown fine sandy loam that contains many fragments of schist over red clay loam that contains fragments of schist.	Upland slopes and ridges.	Good	2–45	Material weathered from quartz mica schist and garnetiferous quartz mica schist.
Mayodan	Yellowish-brown sandy loam over strong-brown clay.	Upland slopes	Good	2–6	Material weathered from Triassic sandstone or from sediments in Triassic basins.
Wickham	Dark-brown fine sandy loam over yellowish-red clay.	Terraces	Good	2–10	Old alluvium.
Red-Yellow Podzolic soils (intergrading toward Reddish-Brown Lateritic soils):					
Lloyd	Reddish-brown and dark reddish-brown loam over red to dark-red clay.	Upland slopes and ridges.	Good	2–25	Material weathered from mixed acidic and basic, igneous and metamorphic rocks.

TABLE 9.—*Soil series classified in great soil groups and some factors of soil formation* —Continued

Great soil group and soil series	Brief profile description [1]	Position	Drainage	Slope	Parent Material
				Percent	
Red-Yellow Podzolic soils (intergrading toward Low-Humic Gley soils):					
Colfax	Light olive-brown and light yellowish-brown sandy loam over olive-yellow clay mottled with yellowish brown and light gray.	Upland depressions and draws.	Somewhat poor.	2–6	Material weathered from acid rocks and local alluvium.
Reddish-Brown Lateritic soils (central concept):					
Davidson	Dark reddish-brown clay loam over dark-red clay.	Upland slopes and ridges.	Good	2–25	Material weathered from diorite, gabbro, and hornblende-gneiss.
Hiwassee	Dark reddish-brown loam over dark-red clay.	Terraces	Good	2–10	Old alluvium.
Reddish-Brown Lateritic soils (intergrading toward Planosols):					
Mecklenburg	Dark-brown loam over yellowish-red, firm clay.	Upland slopes and ridges.	Good	2–15	Material weathered from diorite, gabbro, and basalt.
Planosols:					
Iredell	Dark-brown loam over dark yellowish-brown, plastic clay.	Upland slopes and ridges.	Good to moderately good.	2–10	Material weathered from diorite and gabbro.
Low-Humic Gley soils:					
Wehadkee	Brown silt loam that is mottled with light olive gray and overlies light-gray sandy clay.	First bottoms	Poor	0–2	Alluvium.
Worsham	Dark grayish-brown loam over light-gray clay that is mottled with brownish yellow.	Upland depressions and draws.	Poor	2–6	Material weathered from acid rocks and local alluvium.
Low-Humic Gley soils (intergrading toward Planosols):					
Roanoke	Dark grayish-brown loam over gray, very firm clay with yellowish or reddish streaks.	Terraces	Poor	0–2	Old alluvium.
Warne	Very dark gray and pale-yellow fine sandy loam or loam over light olive-gray or gray, very firm clay that is mottled with yellowish brown.	Terraces	Somewhat poor.	0–2	Old alluvium.
Lithosols:					
Wilkes	Olive-brown loam over yellowish-brown clay or weathered, mixed acidic and basic rocks.	Upland slopes and narrow ridges.	Good	6–55	Material weathered from mixed acidic and basic rocks.
Lithosols (intergrading toward Red-Yellow Podzolic soils):					
Louisa	Yellowish brown and reddish-yellow sandy loam over weathered gneiss and schist.	Upland slopes and narrow ridges.	Good to excessive.	6–55	Material weathered from mica gneiss and mica schist.
Louisburg	Dark grayish-brown and brownish-yellow sandy loam over yellowish-brown sandy loam.	Upland slopes and narrow ridges.	Good to excessive.	6–55	Material weathered from gneiss and granite.

TABLE 9.—*Soil series classified in great soil groups and some factors of soil formation*—Continued

Great soil group and soil series	Brief profile description [1]	Position	Drainage	Slope	Parent Material
Alluvial soils (central concept):				*Percent*	
Buncombe	Dark yellowish-brown to light yellowish-brown loamy sand and sand.	First bottoms	Excessive	0–2	Alluvium.
Chewacla	Light-brown to dark reddish-brown silt loam to fine sandy loam over mottled light-gray, dark yellowish-brown, and reddish-brown silt loam.	First bottoms	Somewhat poor.	0–2	Alluvium.
Congaree	Dark-brown fine sandy loam to loam over dark yellowish-brown to yellowish-brown fine sandy loam to silt loam.	First bottoms	Good to moderately good.	0–2	Alluvium.
Starr	Dark reddish-brown to dusky-red loam over dark-red clay loam.	Upland depressions.	Good	2–6	Local alluvium.

[1] Descriptions are of profiles that have not been seriously affected by accelerated erosion.

Red-Yellow Podzolic soils

This group consists of well-drained, acid soils that have a well-developed profile. The soils formed under forest in a warm-temperate, moist climate. The forest cover was mainly deciduous, but it included a few conifers. In areas that have not been disturbed, the soils have a thin, organic A_0 horizon, an organic-mineral A_1 horizon, a light-colored, bleached A_2 horizon, and a red, dark-red, yellowish-red, strong-brown, or yellow, clayey B horizon. In most places there is a highly acid, generally mottled or variegated C horizon. The parent material is more or less siliceous.

In cultivated areas the A horizons are mixed and form the A_p horizon, or plow layer. In some places erosion has been severe and the B horizon is exposed or is mixed with the material remaining in the A horizons. In these places the former subsoil is now the plow layer and is of a different texture than the original plow layer.

The soils of this great soil group generally have low cation-exchange capacity and low base saturation. They are medium acid to strongly acid. Kaolinite is the dominant clay mineral. In most places there is a concentration of vermiculite in the A horizons and a small amount of gibbsite in the B horizon.

In Iredell County undisturbed Red-Yellow Podzolic soils have a thin, dark-colored A_1 horizon that has weak granular structure. The A_1 horizon contains more organic matter than the A_2 horizon, which is light colored and has weak, granular structure. The B_2 horizon contains more clay than the A_2 horizon and has moderate to strong, subangular blocky structure. The C horizon contains less clay than the B_2 horizon; it has a weak structure or consists of fragments of rock.

The Red-Yellow Podzolic soils in Iredell County are the soils of the Cecil, Madison, Appling, Mayodan, Altavista, Wickham, Lloyd, and Colfax series. The profiles of all of these soils, except those of the Lloyd and Colfax series, are within the central concept of the Red-Yellow Podzolic great soil group.

The subsoil of the Cecil and Madison soils is red, well drained, and thick to moderately thick. It has moderate, medium, subangular blocky structure. The profile of the Cecil soils is more strongly developed than that of the other Red-Yellow Podzolic soils in the county. The Madison soils contain more mica in the B and C horizons than the other Red-Yellow Podzolic soils in the group, and they have a thinner profile.

The subsoil of the Appling and Mayodan soils is yellowish red to strong brown, but the other profile characteristics are similar to those of the Cecil soils.

The Altavista and Wickham soils have formed in old alluvium. The Altavista soils are moderately well drained or well drained, and their subsoil is not so red as that of the Cecil soils. The A horizon of the Wickham soils is browner than that of the Cecil soils, and in some places the B_2 horizon is less red.

The Lloyd soils are Red-Yellow Podzolic soils that have some characteristics of Reddish-Brown Lateritic soils. Their A_2 horizon is less distinct than that of the Cecil soils, and their B_2 horizon is darker red. The Lloyd soils have a slightly higher base saturation and are not so acid as the soils that are representative of the Red-Yellow Podzolic group.

The Colfax soils are Red-Yellow Podzolic soils that have some characteristics of Low-Humic Gley soils. They have a distinct A_2 horizon, but the soil material in the lower part of the profile is gleyed. The Colfax soils are somewhat poorly drained and formed in material weathered from acidic rock or in local alluvium washed from the surrounding soils.

Reddish-Brown Lateritic soils

This great soil group consists of well-drained, acid soils that have a well-developed profile. The soils formed in a warm-temperate, moist climate under a forest made up mainly of deciduous trees, but that included a few conifers. The soils have a surface layer of dark-colored, granular loam or clay loam. Their surface layer overlies a subsoil

of dark-red, firm clay. The parent material is red or reticulately mottled and is lateritic. These soils lack the distinct, leached A_2 horizon that is typical of the Red-Yellow Podzolic soils. The B horizon is dark red, and it commonly has moderate, medium, subangular blocky structure.

The soils of this great soil group in Iredell County generally have a thicker profile, are less acid, and have higher cation-exchange capacity and base saturation than the Red-Yellow Podzolic soils. The dominant clay mineral is kaolinite, but there are small amounts of vermiculite and gibbsite.

In Iredell County the Reddish-Brown Lateritic soils are in the Davidson and Hiwassee series and are within the central concept of the Reddish-Brown Lateritic great soil group. The Mecklenburg soils are also in this great soil group, but they have some characteristics of Planosols. The Davidson and Hiwassee soils have an A horizon of dark-red or dark reddish-brown loam or clay loam. Their B horizon is thick and consists of dark-red, firm clay. The Davidson soils formed in material weathered from diorite, gabbro, and hornblende gneiss, and the Hiwassee soils formed in old alluvium.

The Mecklenburg soils are Reddish-Brown Lateritic soils that have a B horizon of heavy, plastic clay like that of the Planosols. The Mecklenburg soils formed in material weathered from diorite, gabbro, and basalt.

Planosols

The soils in this great soil group have, at varying depths, a well-defined layer of clay or of cemented material. They formed on uplands under a cover of grass or forest in a humid or subhumid climate.

The soils in this great soil group in Iredell County generally have high cation-exchange capacity and high base saturation. In these soils the clay minerals are mainly montmorillonite and vermiculite, but in the A horizon there is considerable kaolinite.

The Iredell soils are the only Planosols in Iredell County. These soils have a surface layer of very dark grayish-brown to olive loam and a subsoil of light olive-brown to yellowish-brown, plastic clay. Their subsoil is slowly permeable and is somewhat poorly drained to moderately well drained. The Iredell soils formed in material weathered from diorite and gabbro.

Low-Humic Gley soils

This group consists of soils that formed under the influence of nearly level relief, imperfect drainage, and a high water table. These soils are poorly drained and somewhat poorly drained. In areas that have not been disturbed, they have a thin, dark-colored surface layer that is high in organic matter. The surface layer is underlain by mottled gray and brown, gleyed horizons whose texture differs only slightly from that of the surface layer. These soils are generally acid to strongly acid and have low base saturation.

In Iredell County the soils in the Low-Humic Gley group are in the Wehadkee, Worsham, Warne, and Roanoke series. The Wehadkee and Worsham soils are within the central concept of the Low-Humic Gley great soil group. The Warne and Roanoke soils are intergrading toward Planosols.

The Wehadkee soils are poorly drained and formed in recent alluvium deposited by streams. They are in low areas of first bottoms along large and small streams and are subject to frequent overflow. These soils generally have a thin, dark-colored, silty surface layer that overlies light-gray sandy clay or gray, stratified soil material.

The Worsham soils are poorly drained and formed in local alluvium or in material weathered from acidic rocks. They are in depressions and draws in the uplands, especially around the heads of springs. They generally have a dark-colored surface layer over light-gray clay that is mottled with brownish yellow.

The Warne and Roanoke soils have a subsoil of heavy, plastic clay like that of the Planosols. The Warne soils are somewhat poorly drained and have a surface layer of fine sandy loam, and the Roanoke soils are poorly drained and have a surface layer of loam. In some places the Warne soils have an A_2 horizon in the profile. The Warne and Roanoke soils are on low terraces along the larger streams in the county.

Lithosols

This great soil group consists of soils that have no distinct profile development. These soils consist of material that is freshly and incompletely weathered. They are primarily on narrow ridges and on steep side slopes.

The Wilkes, Louisburg, and Louisa soils are the Lithosols in this county. The Wilkes soils are within the central concept of the Lithosol great soil group. The Louisburg and Louisa soils are intergrading toward Red-Yellow Podzolic soils. The Wilkes soils formed in material weathered from mixed acidic and basic rocks, and they are shallow over bedrock. In a few places they have a thin, weakly developed, and discontinuous B horizon. These soils are medium acid to slightly acid, and they generally have high base saturation.

The Louisburg and Louisa soils are Lithosols that have some characteristics of Red-Yellow Podzolic soils. These soils have a distinct A_2 horizon. They are generally sandy throughout the profile and are shallow over bedrock. In a few places they have a thin, weakly developed, discontinuous B horizon. These soils are strongly acid and have low base saturation. The Louisburg soils formed in material weathered from granite and granite gneiss, and the Louisa soils, in material weathered from mica gneiss and mica schist. The Louisa soils contain more mica than the Louisburg soils.

Alluvial soils

Alluvial soils are forming in alluvial materials that have been recently transported and deposited by water. This alluvium has been changed little by the soil-forming factors. The characteristics of these soils are determined by the nature of the materials in which they are forming, by the way the materials were sorted and deposited, and by the kind of drainage in the place where they were deposited.

In Iredell County the Buncombe, Congaree, Chewacla, and Starr soils are in this great soil group. All of these soils are within the central concept of soils of the Alluvial great soil group.

The Buncombe soils are excessively drained, sandy soils of the first bottoms. In most places these soils consist of

stratified, dark yellowish-brown loamy sand that overlies light yellowish-brown loamy sand or sand. These soils generally lie next to streams and are subject to frequent overflow.

The Congaree soils are well drained or moderately well drained and are on first bottoms. They have a surface layer of dark yellowish-brown fine sandy loam to loam. The surface layer overlies dark yellowish-brown to yellowish-brown fine sandy loam or silt loam. In most places the Congaree soils are stratified, but in a few areas they have a weakly developed profile.

The Chewacla soils are somewhat poorly drained and are on first bottoms. Their surface layer is light-brown to dark reddish-brown silt loam to fine sandy loam. It overlies mottled light-gray, dark yellowish-brown, and reddish-brown silt loam. These soils are stratified in most places.

The Starr soils are in depressions in the uplands. They are well drained. In most places they consist of dark reddish-brown to dusky-red loam to clay loam over red to dark-red clay loam to silty clay loam. In areas where these soils are forming in recent alluvium, they have no distinct horizons. But where the soils are forming in old alluvium, there are some faint horizons in places.

General Nature of the County

In this section the physiography, relief, and drainage, geology, water supply, climate, and wildlife are discussed. Information is given about the settlement and development of the county, about community facilities, industries, and transportation and markets. Also given are facts about the agriculture in the county. The statistics used are mainly from reports published by the U.S. Bureau of the Census.

Physiography, Relief, and Drainage

Iredell County is in the upper Piedmont Plateau. This plateau consists of an old, uplifted area that has been dissected by a network of streams that flow eastward. It is gently rolling, but near some of the larger streams there are cuts as much as 150 feet deep (*6*). Prominent peaks, or monadnocks, rise several hundred feet above the present land surface in the northwestern part of the county. The monadnocks are composed mostly of quartzite, sillimanite schist, poorly fractured and massive granite and diorite, and other resistant rocks.

The most pronounced differences in elevation occur between areas in the northwest and in the southeast. The lowest place in the county has an elevation of 700 feet; it is at a point where the South Yadkin River crosses the Davie County line. The highest place, on Fox Mountain in the northwestern part of the county, has an elevation of 1,760 feet. At the courthouse in Statesville, the county seat, which is in the central part of the county, the elevation is 926 feet.

The original topography of the county has probably been altered somewhat by erosion. In most places there is a thick layer of soil material and of soft, weathered rock over the underlying bedrock. In some parts of the county, gullies at the heads of streams have cut as deep as 40 feet into the weathered material. Stone lines at various depths in the soil material and weathered rock indicate that repeated cutting and filling may have occurred until the present landscape of long, smooth slopes became more or less stable.

Most of the county is drained by the South Yadkin River and its tributaries. The principal tributaries of this river are the Hunting, Patterson, Fourth, and Third Creeks. These streams are nearly parallel and flow eastward across the county. Most of them join the South Yadkin River in Rowan County. Another large stream, the Catawba River, forms the southwestern boundary of the county. It has only a small watershed within the county, and only short, small tributaries. In several places the divide between the watersheds of the South Yadkin River and the Catawba River is as little as 5 miles from the Catawba River.

Because of the rolling and hilly relief in a large part of the county, the natural drainage is moderate to rapid, except for some areas on first bottoms and in areas of colluvium where drainage is somewhat poor. Most of the valleys are U-shaped, and the first bottoms of fairly small streams are near the heads of the streams in many places.

Geology

Iredell County is underlain primarily by igneous and metamorphic rocks, mainly of schist, gneiss, granite, and diorite. In most parts of the county, there are intrusions of granite in the mica schist and mica and hornblende gneiss. Local changes in the types of rocks are common, and large, homogeneous masses of a single type of rock are rare. The rocks have been tilted by movement of the earth's crust. In many places they outcrop in fairly thin bands, especially in the northeastern part of the county (*6*).

It is probable that in geologic times old sedimentary and igneous rocks were folded and faulted and were metamorphosed by heat and pressure to form various kinds of schist. Igneous rocks, particularly granite, were later intruded into the preexisting rocks. The emplacement of granite was either preceded or accompanied by a general metamorphism of the crystalline schist. During that period, the granite, aided by the high temperature and pressure, penetrated the schist. The granite emplacement probably occurred near the close of Paleozoic time.

Composite gneiss is the most abundant kind of rock in Iredell County. It consists chiefly of mica schist that is interlayered with granite, or of banded, granular layers of feldspar, quartz, muscovite, and biotite mica. In many places the composite gneiss is mixed with hornblende gneiss, and in those areas the soils are a darker red and are less sandy than the soils underlain only by composite gneiss.

Hornblende gneiss is also common in the county and occurs as a large, fairly homogeneous mass or as thin sill-like layers within the composite gneiss or in other rocks. Weathered hornblende gneiss can be seen in many road cuts. Except along the hilly areas in the northwestern part of the county, the hornblende gneiss is deeply weathered. East of Turnersburg is an area where the hornblende gneiss is mixed with a scattering of soapstone and coarse, crystalline, enstatite rock. In that area the soils are

lighter colored than those underlain by typical hornblende gneiss.

An area of soils underlain by gabbro is in the eastern part of the county along U.S. Highway No. 70, and another is in the southwestern corner of the county. Soils underlain by granite-diorite occur only in an area along the southern and eastern borders of the county.

Granite occurs as a large, nearly homogeneous mass, as veins and sheets, or as an intrusion in some other kinds of rock. The largest area underlain by granite is near Mooresville. That area is broad and has streams on both sides. Here, weathering is deep. Fresh outcrops of granite are varied in texture, but the granite is commonly porphyritic. The boundary between areas underlain by granite and areas underlain by other rocks is indefinite. The soils underlain by granite are similar to the soils southeast of Troutman, which are underlain by composite gneiss. Southwest of Mooresville, a gradational contact occurs between granite and gabbro. Otherwise, granite occurs in countless thin, lenslike units that are interlayed with schist and gneiss.

Southeast of Harmony in the community of V-Point is an area of 400 to 500 acres where the soils are light colored and sandy. Their subsoil consists of material weathered from unsorted quartz and arkosic material. The rocks in this area probably represent an outlying remnant of deposits of Triassic age similar to those that were laid down several miles to the northeast in Davie County.

Water Supply

Most of the water for domestic use in Iredell County is obtained from wells and springs. The municipalities of Statesville and Mooresville, however, use nearby rivers or creeks as a source of water.

Springs are common in the county, but they are generally inaccessible and yield less than 3 gallons per minute. Therefore, they are not used to supply water for the farms or homes. Most rural areas obtain water from wells that are dug or bored. These wells are generally 2 to 4 feet in diameter and penetrate the bedrock. Drilled wells that are 6 inches in diameter supply water for industries, small towns, and rural areas where large amounts of water are needed (*13*). The temperature of the water in the wells ranges from 50° to 61° F.

Most wells of the county are put down in hills. These wells are less productive than wells in the draws and valleys. This is because the underlying rocks in the hills are more resistant than in the draws and valleys, and the rocks have fewer breaks in them to facilitate the entrance of ground water. Furthermore, the movement of ground water is naturally away from the wells drilled in the hills and toward the valleys, where it runs into the streams.

Most of the rocks that underlie the county have a gneissoid or schistose structure. Along the seams in these rocks are fractures where water is held. As a result, the areas underlain by such rocks have adequate supplies of water available for most needs. The thick mantle of weathered rock that overlies the bedrock contains much fine material that acts as a reservoir so that water seeps continuously from that material into the fractures in the bedrock. In large areas underlain by hornblende gneiss, gabbro, and diorite, the rocks favor the development of wells that yield large amounts of water because fractures in these rocks are generally enlarged by solution.

One part of the county differs but little from other parts in the capacity to supply water. The area that has the largest supply is probably that north and west of Statesville, which is underlain by hornblende gneiss. Deposits of sand and gravel along parts of most streams also furnish large amounts of water to wells. For example, one well in the county, in a saddle between two draws underlain by hornblende gneiss, has a flow of 660 gallons of water per minute and a drawdown of less than 60 feet.

Climate [7]

The climate in Iredell County is fairly mild. It is influenced by the mountain ranges to the northwest, which have a sheltering effect, and by the rolling terrain that is characteristic of the foothills. The Atlantic Ocean, which lies about 225 miles to the southwest, also influences the climate, but its effect is less in this county than in counties nearer the coast. Information about the temperature and precipitation for the county are given in table 10. Except for snow data, which are from records of the U.S. Weather Bureau at Winston-Salem in Forsyth County, the data are from records of the U.S. Weather Bureau at Statesville.

Two mountain ranges—the Brushy Mountains and the main ridge of the Blue Ridge Mountains—affect the climate of the county. Of these two ranges, the Brushy Mountains are nearest. These mountains extend in a northeast-southwest direction across several counties. They touch the northwestern corner of the county, and, a few miles farther to the northwest, they reach their maximum elevation of about 2,500 feet. The Blue Ridge Mountains are 20 miles beyond the Brushy Mountains. They are 1,000 to 1,500 feet higher than the Brushy Mountains but are similarly alined. The two ranges are separated by the valley of the Yadkin River and provide a barrier that holds back the flow of cold air from winter storms that move down from Canada. Thus, the weaker storms are often prevented from reaching the county, and the stronger storms are modified as they pass over the mountains.

Locally, the rolling foothills in the county cause variations and slight differences in climate from place to place and within fairly short distances. The differences are most evident in the minimum temperatures. In places the waterways of the area also influence the county by their effect on air drainage.

When the general flow of wind is fairly strong, the effect of air drainage is overcome and temperatures remain fairly uniform throughout much of the county. During periods of clear, calm weather, however, the cold air, which is heavier than warm air, tends to accumulate in low places at night and causes differences of several degrees in the minimum temperature within short distances. In places the cold air flows southward and downward out of the mountain valleys into gently rolling areas. There it causes sharp contrasts in frost and freezing conditions from the tops of the hills to the bottoms of the valleys and from one valley to the next.

[7] A. V. HARDY, state climatologist, North Carolina, and Forrest Steele, State soil scientist, assisted with this section.

TABLE 10.—*Temperature and precipitation for Iredell County, N.C.*

[Elevation, 950 feet]

[All data except that for snowfall are from records of U.S. Weather Bureau at Statesville; data on snow are from the records at Winston-Salem in Forsyth County]

Month	Average daily maximum temperature	Average daily minimum temperature	Two years in 10 will have at least 4 days with—		Average monthly total precipitation	One year in 10 will have—		Days with snow cover	Average depth of snow on days with snow cover
			Maximum temperature equal to or higher than	Minimum temperature equal to or lower than		Precipitation less than	Precipitation more than		
	°F.	°F.	°F.	°F.	Inches	Inches	Inches	Number	Inches
January	53	32	69	15	4.0	1.8	7.1	4	1
February	56	33	70	18	3.7	1.3	6.2	2	2
March	62	38	77	22	4.6	2.2	6.8	2	5
April	72	47	85	31	3.7	1.7	5.4	0	0
May	80	56	91	44	3.5	.8	5.5	0	0
June	87	65	96	54	3.6	1.0	7.5	0	0
July	89	68	97	61	5.1	2.3	8.2	0	0
August	87	67	96	59	4.8	2.3	7.5	0	0
September	83	61	92	48	3.7	1.0	9.0	0	0
October	74	49	88	35	3.2	.7	7.0	0	0
November	62	39	76	24	3.1	1.2	6.8	0	0
December	53	32	68	16	3.9	1.8	7.0	1	1
Year	71	49	[1] 99	[2] 9	46.9	36.3	61.2	9	2

[1] Average annual highest maximum.

[2] Average annual lowest minimum.

Prevailing winds in the county are from the southwest, but northeasterly winds are nearly as frequent and occur especially in autumn. The average windspeed is about 8 miles an hour, but it is 1 or 2 miles an hour greater in March and April and a little less in summer. Extreme winds are more likely to occur in summer than at other times; winds that have a velocity of 50 to 70 miles per hour generally occur once or twice in 20 years. Severe tornadoes occur rarely in North Carolina, and only one has occurred in Iredell County in the past 50 years.

The sun shines about 60 percent of the daylight hours in Iredell County. The hours of sunshine range from about one-half the day in December and January to more than two-thirds of the day in May and June. The relative humidity averages about 70 percent the year around. The humidity is highest late in summer, and it is lowest in spring.

Precipitation

Precipitation is generally plentiful throughout the year and is well distributed in all parts of Iredell County. The amount of rainfall varies considerably from place to place during a particular rain. Over a long period of time, however, the average rainfall is fairly uniform throughout the county, and the average figures given for precipitation in table 10 can be considered fairly accurate for all parts.

In this county most precipitation in winter comes as the result of low-pressure storms that move over the area. The rainfall in summer is the result of thunderstorms. The distribution of rainfall in winter is more even than that in summer because storms in winter cover a larger area and last longer. The rainfall in summer often occurs as an isolated thunderstorm. The storm produces heavy rain for a short time within one small area, but other nearby areas receive smaller amounts of rain or none. Repeated storms of this kind sometimes cause a marked variation in the amount of moisture in the soils within fairly short distances. A shortage of moisture from one field to another, related to this local variation in rainfall, is seldom serious, but crops are often damaged to some extent. Supplemental irrigation may be needed to save the crop.

The data for snow cover given in table 10 are from a 10-year record at Winston-Salem in Forsyth County. Individual snowstorms differ greatly in the two counties, but the average figures for snowfall are similar over a period of years. Snowfall is generally heavier in March, and records of the period since 1920 show that, on the average, snow accumulates to a greater depth in March than early in winter and in midwinter. Snow also accumulates on the ground in April and November once in 10 to 20 years, but it generally melts rapidly.

Thunderstorms in summer sometimes bring strong winds or hail or both, but the areas damaged by hail are generally small. In an average summer, winds are generally strong enough in several places within the county to break tree limbs, signboards, and the like. These areas range in size from less than 1 acre to 1 square mile or more, but the total area seriously damaged by winds in summer is small.

Occasionally, 3 to 4 inches of rain falls in 1 hour. Then flash flooding is likely along the small streams of the county. The floods cause damage to roads and bridges,

and they also erode the farmlands. They are infrequent, however, and generally affect only small areas. On the average, rainfall of as much as 2 inches in 1 hour does not occur more than once in 10 years, and rainfall of 4 inches in 1 hour occurs probably once in 50 years.

The likelihood of damage from hail in the county is even less than that of damage by flooding. Some hail falls within the county nearly every year, but hailstorms are most likely in May, June, July, and August; they are more likely to occur the first 2 months than in the last 2. More hailstorms occur in the northern part of the county than in other parts.

Tropical hurricanes, winter cold fronts, ice storms, or sleet storms also occur in the county occasionally. Tropical hurricanes seldom cause damage, but they generally cause an increase in rainfall and bring winds of moderate force. Winter cold fronts generally come from the northwest, and their intensity is diminished as they cross the mountain ranges northwest of the county. Ice storms, on the other hand, are more common in this county than in the eastern part of the State. They generally come on easterly winds that blow around storms centered along the coast at the same time cold air is pushing southward over the interior. As a result, rain falls within a large area of borderline temperatures that are likely above freezing near the coast but below freezing in the interior. On the average, storms that lay a thin coating of ice on trees, shrubs, and communication lines are likely to occur in Iredell County about twice each winter. But ice storms that cause damage by breakage occur only once in several years.

Probability of freezing temperatures

If a farmer knows the likelihood of light, moderate, and severe freezes in spring and fall, he can select the best planting dates for crops that are sensitive to frost or for those that are hardy. The probabilities of freezing temperatures are shown in figure 10. To determine from figure 10 the probability that there will be a temperature at Statesville of 28° or lower after April 1, lay a ruler vertically on the line extending from the point indicated for April 1. Look to the left from the point where the rule crosses the diagonal 28° line, and read the percentage listed at the side of the graph. For this example, the probability is between 20 and 30 percent, or about 3 years in 10. In the same manner you can determine from figure 11 the probability that the temperature listed will occur before the dates indicated in fall.

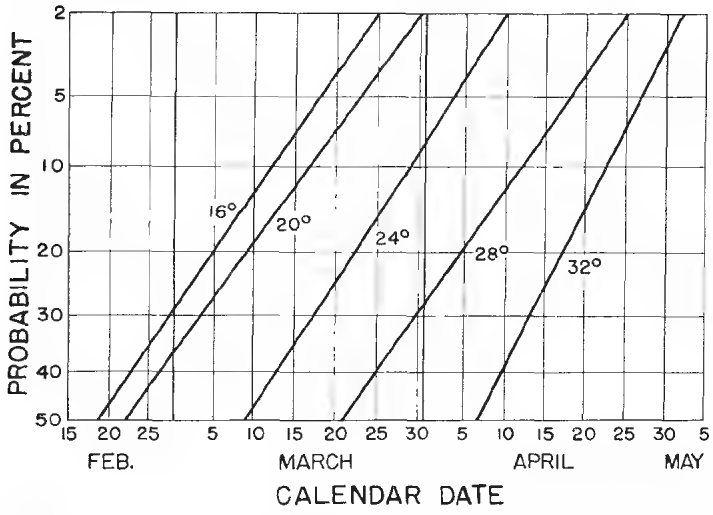

Figure 10.—**Probability that the temperature at Statesville will be 16° F. or lower, 20° or lower, 24° or lower, 28° or lower, or 32° or lower after the dates indicated in spring.**

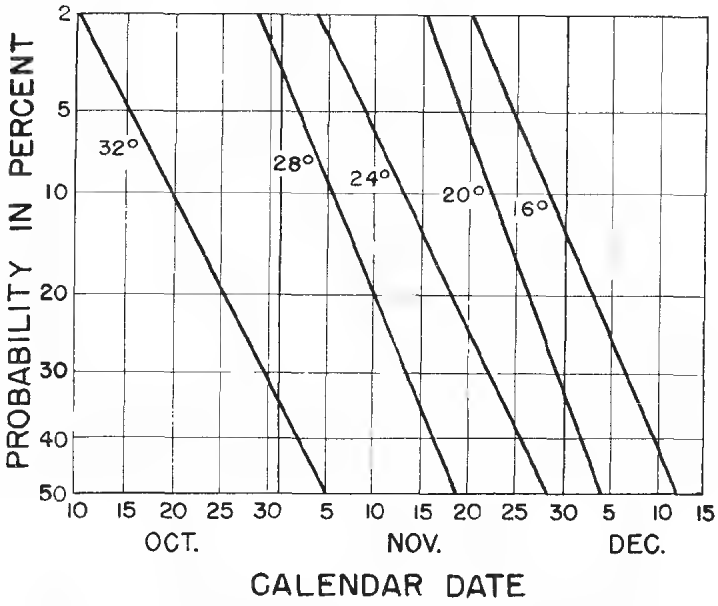

Figure 11.—**Probability that the temperature at Statesville will be 16° F. or lower, 20° or lower, 24° or lower, 28° or lower, or 32° or lower after the dates indicated in fall.**

The averages of earliest and latest freezing temperatures and of other low temperatures used in preparing figures 10 and 11 are subject to some variation within the county and even within a single community. Nevertheless, the dates shown in figures 10 and 11 can be used as a general guide to planting. The dates are representative of the nearly level areas in the central and southern parts of the county. In some areas frost is a little later in spring or is earlier in fall than the averages given, and, in the rugged, northwestern part of the county, variations from the averages in figures 10 and 11 are markedly greater.

Probability of drought

Drought exists when not enough water is available in the soil to supply the needs of growing plants. The frequency and intensity of drought depend mainly on the amount and distribution of rainfall, on the capacity of the soil to supply water to plants, and on the distribution of plant roots in the soil.

If a farmer knows when damaging drought is most likely to occur and the kinds of crops that will resist drought on certain soils, he can plant crops that are less likely to be damaged. He will know the risk he takes in planting certain crops on certain soils. If he knows the frequency of dry spells and how long they are likely to last, he can estimate the value of irrigation and decide whether an irrigation system will increase crop yields enough to offset the cost.

ESTIMATING CHANCE OF DROUGHT DAMAGE TO A CROP

Lists A and B can be used with table 11 to judge the likelihood that drought will damage a particular crop on a specified soil. In list A find the name of the crop and the average depth of its root zone. Then turn to list B where the total capacity of soils to hold moisture is given for 12-inch, 18-inch, 24-inch, and 36-inch depths. When you have learned the available moisture capacity of the soil down to the depth where roots of the crops will penetrate, turn to table 11, where you are given the chances of drought days, by months, for capacities that range in inches from 0.6 to 1.5, 1.6 to 2.5, 2.6 to 3.5, and 4.6 to 5.5.

LIST A: Normal Root Zone for Crops

Eighty percent of roots at depth not exceeding—

12 inches	*18 inches*	*24 inches*	*36 inches*
Grasses, annual.	Cabbage.	Asparagus.	Alfalfa.
Lespedeza, annual.	Clover, crimson.	Cantaloups.	Fruit trees.
Lettuce.	Clover, ladino.	Corn.	Grasses, perennial.
Kale.	Cowpeas.	Cotton.	Kudzu.
Mustard.	Lima beans.	Okra.	Lespedeza, sericea.
Onions.	Tobacco.	Sorghum, grain.	
Small grains.	Tomatoes.		
Spinach.			
Turnips.			

LIST B: Total Available Moisture

Soils:	Average available moisture capacity, in inches of water, of soil from surface to—			
	12-inch depth	*18-inch depth*	*24-inch depth*	*36-inch depth*
Altavista fine sandy loam	1.3	2.4	3.4	5.2
Appling sandy clay loam	1.5	2.4	3.3	4.9
Appling sandy loam	1.2	2.1	3.1	4.7
Buncombe loamy sand	.7	1.3	1.7	2.8
Cecil clay loam	1.4	2.3	3.3	5.0
Cecil fine sandy loam	1.4	2.3	3.3	5.0
Cecil gravelly fine sandy loam	1.1	2.0	3.0	4.7
Cecil sandy loam	1.4	2.3	3.3	5.0
Cecil soils	1.4	2.3	3.3	5.0
Cecil stony fine sandy loam	(1)	(1)	(1)	(1)
Chewacla soils	1.5	2.4	3.3	4.9
Colfax sandy loam	1.1	1.9	2.7	4.3
Congaree soils	1.3	2.0	2.7	4.0
Davidson clay loam	1.7	2.7	3.7	5.5
Hiwassee loam	1.7	2.7	3.7	5.5
Iredell loam	1.9	(2)	(2)	(2)
Lloyd clay loam	1.4	2.3	3.3	5.0
Lloyd loam	1.7	2.7	3.7	5.5
Lloyd fine sandy loam	1.4	2.3	3.3	5.0
Local alluvial land	1.3	2.0	2.7	4.0
Louisburg and Louisa soils	.8	1.3	1.8	(2)
Made land	(1)	(1)	(1)	(1)
Madison gravelly fine sandy loam	1.1	2.0	2.9	4.4
Mayodan sandy loam	1.2	2.1	3.1	4.7
Mecklenburg clay loam	1.7	2.7	3.7	5.5
Mecklenburg loam	1.7	2.7	3.7	5.5
Mixed alluvial land	1.3	2.0	2.7	4.0
Mixed alluvial land, wet	1.5	2.2	2.9	4.5
Moderately gullied land, rolling	(1)	(1)	(1)	(1)
Severely gullied land	(1)	(1)	(1)	(1)
Starr loam	1.7	2.7	3.7	5.5
Warne and Roanoke fine sandy loams	1.3	2.4	3.4	5.2
Wehadkee silt loam	1.5	2.2	2.9	4.5
Wickham fine sandy loam	1.3	2.4	3.4	5.2
Wilkes soils	.8	1.3	1.8	(2)
Worsham loam	1.5	2.2	2.9	4.5

[1] Variable soil conditions, and the soil is not ordinarily used for cultivation.

[2] Water generally not available to most plants at the depths shown.

TABLE 11.—*Chance of drought days on soils of different moisture-storage capacity*

Month [1]	Chance	Minimum drought days if soil has a moisture-storage capacity of [2]—				
		0.6 to 1.5 in.	1.6 to 2.5 in.	2.6 to 3.5 in.	3.6 to 4.5 in.	4.6 to 5.5 in.
April	1 in 10	11	0	0	0	0
	2 in 10	9	0	0	0	0
	3 in 10	7	0	0	0	0
	5 in 10	4	0	0	0	0
May	1 in 10	23	19	12	5	0
	2 in 10	19	14	7	0	0
	3 in 10	17	11	4	0	0
	5 in 10	12	5	0	0	0
June	1 in 10	23	20	18	14	10
	2 in 10	20	17	14	10	5
	3 in 10	18	14	11	7	0
	5 in 10	15	10	6	2	0
July	1 in 10	21	19	19	15	14
	2 in 10	18	15	14	11	9
	3 in 10	16	12	10	8	6
	5 in 10	12	7	4	2	0
August	1 in 10	19	16	14	12	10
	2 in 10	16	12	9	6	4
	3 in 10	14	9	5	2	0
	5 in 10	10	4	0	0	0
September	1 in 10	22	20	15	13	11
	2 in 10	19	15	11	8	5
	3 in 10	16	12	8	4	1
	5 in 10	12	6	2	0	0

[1] Months listed are those in which drought damage most commonly occurs. Months of January, February, March, October, November, and December are not shown, because crops are rarely damaged by drought in these months.

[2] Storage capacity of soil is expressed as the depth of water that a soil can hold and make available to plants.

Suppose you want to know how likely it is that there will be dry days in July that will retard the growth of corn on Appling sandy loam. In list A you note that corn has most of its roots in the top 24 inches of soil; therefore, in list B you read under "24-inch depth" and find that Appling sandy loam holds an average of 3.1 inches of available moisture to a depth of 24 inches. Then turn to table 11 and find the column giving 2.6 to 3.5 inches of moisture, the range within which 3.1 inches falls, and read under the column marked "Chance" the chances of days when drought will damage corn. The chances are 1 in 10 that there will be at least 19 drought days in July, 2 in 10 that there will be at least 14 drought days, 3 in 10 that there will be at least 10 drought days, and 5 in 10 that there will be at least 4 drought days.

Or, again, suppose you want to know the likelihood of dry days in June that will retard the growth of tomatoes if they are planted on Cecil fine sandy loam. Tomatoes have most of their roots in the top 18 inches (list A), and to that depth (list B) Cecil fine sandy loam holds an average of 2.3 inches of moisture. By referring to table 11, under the column giving 1.6 to 2.5 inches, we can see that for tomatoes the chances are 5 in 10 that there will be at least 10 drought days in June. Thus, you weigh the costs of planting and irrigating tomatoes, and then decide

whether you should plant or not on this soil, and whether you should irrigate.

Wildlife [8]

The principal kinds of game and fish in Iredell County are similar to those in surrounding counties, but mourning dove, duck, and fish are more plentiful. Gray squirrel, cottontail rabbit, deer, mourning dove, bobwhite quail, snipe, and many kinds of duck and fish are the principal species in the county.

Food and cover for most of the wildlife in the county are not limited to a particular soil, and the animals and birds range over areas of all the soils. Except for the wooded areas in the northern and southwestern parts of the county, the general pattern of land use is about the same throughout the county. On the soils in all parts of the county are small- or medium-sized areas used for crops or pasture, interspersed with about the same-sized acreage in trees.

The same practices for managing wildlife are suitable for use on all of the soils. Field borders, hedgerows, and fences of multiflora rose are desirable to provide food and shelter for wildlife wherever they fit into the pattern of land use. On all of the soils, open areas in the woodlands can be planted to provide food for wildlife. Even seriously eroded or abandoned soils can be used to produce food and cover for wildlife if suitable plants are grown. Small, wet areas in fields, seepage areas, areas of rock outcrops, fence rows, and other areas that are not suited to crops can be used for plants to provide food and cover for wildlife, or the natural vegetation can be allowed to grow on them.

The cottontail rabbit thrives in areas throughout the county where there are brushy and wooded areas. If cover is scanty, the rabbit is an easy prey for the many predators of this animal. Lack of food generally is not a factor in limiting the number of rabbits, as they eat many different kinds of plants, both wild and cultivated. Although the number of rabbits in the county varies from year to year, these animals are distributed fairly uniformly throughout the county.

Gray squirrel prefer woodlands in which there are trees that bear nuts or that can be used for dens. Much of the woodland in the county is not suitable for gray squirrel, because the trees are too small for suitable dens and do not yield enough nuts for food. Gray squirrel are most abundant in the southwestern and northern parts of the county where there are large tracts of suitable woodland.

The deer in Iredell County are primarily in the vicinity of Brushy Mountain in the northern part of the county. They have come into that area from adjoining counties. Much of Iredell County, however, is wooded and provides suitable food and cover for deer. If deer were given adequate protection, they would probably be more numerous in the county.

The mourning dove is abundant in the county during fall and winter. A major migratory flyway crosses the southeastern part of the county, and the fields of small grain and lespedeza provide choice food for the dove. In fall and winter there are also woodcock and Wilson snipe in the county in areas where the habitat is suitable. Except during peak periods of migration, their number is generally small.

Bobwhite quail thrive in most parts of the county, but they are most numerous in the northern half where the habitat has been improved for them. In the northern part of the county, much grain is grown and there is an abundance of food in fall and early in winter. Quail are most numerous in areas where food is plentiful late in winter and early in spring and where there is good cover to protect them.

The Catawba and Yadkin Rivers are major flyways for waterfowl during the fall and winter months. Ducks—mainly mallards, woodducks, greenwing teal, and goldeneyes—are fairly common on the water courses. Except for the goldeneye duck, which frequents only the Catawba River and Lookout Reservoir, all of these ducks winter on the Yadkin River and Hunting Creek.

Waters of the Yadkin and Catawba Rivers, of numerous large creeks and farm ponds, and of Lookout Reservoir provide good habitats for many kinds of fish. Largemouth bass thrive in the waters throughout the county, but they are most abundant in Lookout Reservoir and in the many farm ponds of the county. Smallmouth bass occur only in the upper reaches of the Catawba River and below the dam of Lookout Reservoir. Bluegills, sunfish, warmouth, black and white crappies, yellow perch, blue, yellow, and bullhead, catfish, carp, and suckers flourish in most waters of the county. Recently, striped bass, or rockfish, have been introduced in Lookout Reservoir.

Settlement and Development

The first settlers, who came into the area that is now Iredell County around 1750, were of Scotch-Irish and German descent. They were mainly from Maryland and Pennsylvania. The county was formed in 1788 from Rowan County. It was named in honor of James Iredell of Edenton who was an associate justice of the first United States Supreme Court and was one of the leaders in the State who advocated adoption of the Federal Constitution (*2*).

In 1789, the settlers established a county capital, called Fourth Creek Community, near the center of the county. This community was incorporated into a town in 1847 and was named Statesville; it covered an area of 0.5 square mile.

When the county capital was first established, it was just outside the stockade of Fort Dobbs. Daniel Boone helped defend this fort twice from the Cherokee Indians, and it was from this fort that he was outfitted for his famous journey into Kentucky. Also, Kit Carson, the famous Indian fighter and pioneer, was born in Iredell County. Statesville was the temporary capital of North Carolina while Federal troops occupied Raleigh during the Civil War.

Iredell County has grown and prospered. The city limits of Statesville have been extended several times, and it now covers an area of 9.35 square miles. According to the census, the population in the county was 62,526 in 1960. Statesville had a population of 19,844 in that year; Mooresville, 6,918; Troutman, 648; and Harmony, 322.

[8] E. R. Smith, biologist, Soil Conservation Service, assisted with this section.

To help the farmers advance the conservation of the soil and water resources of the area, the Middle Yadkin Soil Conservation District was established in March 1939. In September of that year, at the petition of many of the farmers in the county, Iredell County was made a part of the established district. One of the main projects in Iredell County is a pilot watershed-protection and flood-prevention plan for the 48,342-acre watershed drained by Third Creek. The plan for the area includes applying practices to conserve the soil, building structures to retard floodwaters, and clearing the channel of the stream.

Community Facilities

Iredell County has 8 high schools and 15 elementary schools. The schools are on paved roads in all parts of the county, and transportation to them is provided by school buses. Mitchell College is located in Statesville.

There are 187 churches in the county, and they are conveniently located in all communities. Two hospitals in Statesville and one in Mooresville give excellent medical and hospital care.

Rural mail service is provided in all parts of the county, and most parts have telephone and electrical service.

Industries

The industries of Iredell County are many and diversified. According to the Employment Security Commission of North Carolina, there are more than 140 manufacturing firms in the county, and about 12,300 people are employed full time by these firms. The firms manufacture textiles and related products, process food, and produce lumber, furniture, stained glass, toys, and many other items. In addition, more than 160 other firms employ a total of about 7,700 people full time. These are mostly retail and wholesale stores, construction firms, transportation and communication firms, or firms that provide other services. The figures are for January 1961 and are for firms that employ four or more people.

Transportation and Markets

The Southern Railway crosses the central part of the county and connects Statesville to markets on the west, east, and south. The Alexander Railway connects Statesville to markets on the west.

U.S. Highways Nos. 64 and 70 cross the county from east to west, and U.S. Highway No. 21 crosses the county from north to south. State Highway No. 150 crosses the southern part of the county from east to west, and there are several other State highways that cross the county.

State or county roads provide access to schools, churches, and markets in all parts of the county. They are graveled or paved roads and can be used except during extremely bad weather. Most of the farmhouses are on unimproved roads, and less than half of them are on paved roads. The farms are mostly less than 4 miles from a market, but some are more than 10 miles from a market.

Agriculture

In Iredell County many farmers own and operate their farms and also work in one of the local industrial plants. On the farms milk is produced; beef, poultry, and other livestock are raised; and pasture, and hay crops, small grains, corn, cotton, and tobacco, and some soybeans, truck crops, and nursery products are grown.

Iredell County had a greater number of dairy cows and cattle of all kinds in 1959 than any other county in North Carolina, according to census records. Poultry raising is the second largest agricultural enterprise. The main cash crops grown in the county are small grains, cotton, and tobacco.

Land use

Farms occupied about 66 percent, or 250,786 acreas, of the total land area of Iredell County in 1959. The farmlands by use and the acreage used for each purpose in 1959 are as follows:

	Acres
Cropland, total	111,947
Harvested	75,479
Used only for pasture	12,464
Not harvested and not pastured	24,004
Woodland, total	90,373
Pastured	68,447
Not pastured	21,926
Other land pastured (not cropland and not woodland)	36,633
Land pastured, total	117,544
Other land (house lots, roads, wasteland, and so on)	11,833

Type, size, and tenure of farms

Of the 2,603 farms in Iredell County in 1959, 1,486 were miscellaneous and unclassified. The remaining farms are listed by type as follows:

Field crop other than vegetable and fruit and nut:	*Number*
Cash grain	55
Tobacco	160
Cotton	200
Dairy	336
Poultry	92
Livestock other than poultry and dairy	112
General farms	162

In 1959, the farms in the county ranged from less than 10 acres to more than 1,000 acres in size. Of these, 171 farms were less than 10 acres in size; 860 were from 10 to 49 acres; 730 were from 50 to 99 acres; 501 were from 100 to 179 acres; 175 were from 180 to 259 acres; and 158 were from 260 to 999 acres. There were 8 farms of more than 1,000 acres, but no farms were larger than 2,000 acres. The average farm was 96.3 acres in size.

About 61 percent of the farms were operated by the owners in 1959, 26 percent were operated by part owners, and 13 percent were operated by tenants. Less than 1 percent of the farms were operated by farm managers.

Crops

The principal crops in Iredell County are pasture, hay, small grains, corn, cotton, tobacco, soybeans, truck crops, and nursery products. In 1959, the acreage of the principal crops was as follows:

	Acres
Hay crops (excluding sorghum, soybeans, and cowpeas):	
Alfalfa and alfalfa mixtures	2,036
Clover, timothy, and mixtures of clover and grasses cut for hay	3,799
Lespedeza cut for hay	13,684
Small grains cut for hay	2,716
Other hay cut	1,094
Grass silage	804
Small grains harvested:	
Wheat	14,174
Oats	13,946
Barley	3,674
Rye	335
Corn for all purposes:	
Harvested for grain	13,029
Cut for silage, hogged or grazed, or cut green for fodder	3,822
Cotton harvested	5,744
Tobacco harvested	944
Soybeans grown for all purposes (acres grown alone)	1,207
Lespedeza grown for seed	4,247
Vegetables harvested for sale	191

A total of 23,443 acres was in improved pasture in 1959. Pasture plants, hay crops, corn, and soybeans are grown in all parts of the county. Small grains are grown primarily in the northern half of the county and around Amity, but they are grown on a smaller acreage in most other parts. Cotton is grown throughout the county, but mainly in the eastern half. Tobacco is grown north of the South Yadkin River. Truck crops are grown mostly in a small area near Mazeppa, and nursery products are grown primarily near Statesville. There are woodlands throughout the county, but the largest acreages are in the northwestern corner of the county and in an area along the Catawba River.

Livestock and livestock products

Livestock and livestock products accounted for approximately 66 percent of the farm income in Iredell County in 1959. Nearly two-thirds of this income was derived from the sale of milk. About equal amounts were derived from the sale of eggs and other poultry products and from the sale of beef cattle, hogs, and other livestock and livestock products.

Most of the dairies and producers of milk are in the northern half of the county, but some are in other parts. The poultry farms are primarily around Statesville, but some are near Mooresville. Beef cattle, hogs, sheep, and other kinds of livestock are raised in all parts of the county.

There are few work animals on the farms, as most of the farming operations are mechanized. In 1959, there were 1,292 horses and mules on 832 farms in the county. Some of the horses are used for riding, rather than for farmwork.

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Glossary

Alluvium. Sand, mud, and other sediments deposited on land by streams.

Available water capacity. The amount of moisture a soil can hold that is available to roots of plants. This is approximately the amount of moisture held between one-third atmosphere and 15 atmospheres of tension.

Basal area. The area, generally expressed in square feet, of the cross section of a single tree or of all the trees in the stand. This is generally inside the bark unless otherwise stated.

Clay. Small mineral soil grains, less than 0.002 millimeter (0.000079 inch) in diameter. (See also Texture, soil.)

Colluvium. Mixed deposits of soil material and rock fragments that have accumulated near the bases of fairly steep slopes through soil creep, slides, or local wash.

Consistence, soil. The nature of soil material that is expressed by the resistance of the individual particles to separating from one another (cohesion) or by the ability of a soil mass to undergo a change in shape without breaking (plasticity). The consistence varies with the moisture content. Thus, a soil aggregate or clod may be hard when dry and plastic when wet. Terms used to describe consistence are—

Friable. When moist, easily crushed by hand and coheres when pressed together. Friable soils are easily tilled.

Firm. When moist, crushes under moderate pressure, but resistance is distinctly noticeable. Firm soils are likely to be difficult to till.

Hard. When dry, is moderately resistant to pressure; can be broken in the hands without difficulty but is barely breakable between thumb and forefinger.

Loose. Noncoherent when moist or dry. Loose soils are generally coarse textured and are easy to till.

Plastic. When wet, retains an impressed shape, and resists being deformed; plastic soils are high in clay and are difficult to till.

Soft. Weakly coherent and fragile; when dry, breaks to powder or individual grains under slight pressure.

Sticky. After pressure, soil material adheres to both thumb and forefinger and tends to stretch somewhat and pull apart rather than pulling free from either digit.

Erosion. The detachment and movement of soil and rock materials by moving water, wind, or ice and by such processes as landslide and creep.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Forest type. A descriptive term used to group stands of trees of similar character regarding composition and development because of certain ecological factors by which they can be differentiated from other groups of stands. The term suggests repetition of the same character under similar conditions.

Horizon, soil. A layer of soil, approximately parallel to the soil surface, having distinct characteristics produced by soil-forming processes. The relative positions of the several soil horizons in a typical soil profile and their nomenclature follow:

Horizon A. The upper horizon of the soil mass from which material has been removed by percolating water; the eluviated part of the solum, the surface soil or surface layer. This horizon is generally divided into two or more subhorizons of which A_0 is not a part of the mineral soil but the accumulation of organic debris on the surface. Other subhorizons are designated as A_1, A_2, and so on.

Horizon B. The horizon to which materials have been added by percolating water; the illuviated part of the solum; the subsoil. This horizon also may be divided into several subhorizons according to the color, structure, consistence, and character of the material deposited. These subhorizons are designated as B_1, B_2, B_3, and so on.

Horizon C. The horizon of partly weathered material underlying the B horizon; the substratum; generally the parent material.

Horizon D. Any stratum underlying the C, or the B if no C is present, which is unlike the C or unlike the material from which the soil has formed.

Mottled (mottling). Irregularly marked with spots of different colors and generally associated with poor drainage. Descriptive terms follow: Contrast—*faint, distinct,* and *prominent;* abundance—*few, common,* and *many;* and size—*fine, medium,* and *coarse.* The size measurements are as follows: *Fine,* commonly less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimension; *medium,* commonly ranging between 5 and 15 millimeters (about 0.2 to 0.6 inch) along the greatest dimension; and *coarse,* commonly more than 15 millimeters (about 0.6 inch) along the greatest dimension.

Parent material. The unconsolidated material from which the soil has formed; generally horizon C of the profile.

Permeability, soil. The quality of the soil that enables it to transmit air and water. Moderately permeable soils transmit air and water readily. Such conditions are favorable for the growth of roots. Slowly permeable soils allow water and air to move so slowly that the growth of roots may be restricted. Rapidly permeable soils transmit air and water rapidly, and the growth of roots is good.

Phase, soil. A subdivision of a soil type or other classification unit having variations in characteristics that are not significant to the classification of the soil in its natural landscape but that are significant to the use and management of the soil. The variations are chiefly in such external characteristics as relief, stoniness, or erosion.

Productivity, soil. The capability of a soil to produce a specified plant or sequence of plants under a defined set of management practices. It is measured in terms of the output or harvest in relation to the input of production factors for a specific kind of soil under a physically defined system of management.

Profile, soil. A vertical section of the soil through all its horizons and extending into the parent material. (See also Horizon, soil.)

Reaction, soil. The degree of acidity or alkalinity of the soil mass, expressed in pH values, or in words, as follows:

	pH		*pH*
Extremely acid	Below 4.5	Neutral	6.6–7.3
Very strongly acid	4.5–5.0	Mildly alkaline	7.4–7.8
Strongly acid	5.1–5.5	Moderately alkaline	7.9–8.4
Medium acid	5.6–6.0	Strongly alkaline	8.5–9.0
Slightly acid	6.1–6.5	Very strongly alkaline	9.1 and higher

Residual soil. Soil that has formed in place by the disintegration and decomposition of rocks and the consequent weathering of the mineral materials. Presumably developed from the same kind of rock as that on which it lies.

Sand. Small fragments of rocks or minerals ranging from 0.05 millimeter (0.002 inch) to 2.0 millimeters (0.079 inch) in diameter. Sand grains consist chiefly of quartz, but they may be of any mineral composition. (See also Texture, soil.)

Series, soil. A group of soils that, except for the texture of the surface soil, have genetic horizons similar as to differentiating characteristics and arrangement in the soil profile, and developed from a particular type of parent material. A series may include two or more soil types that differ from one another in the texture of the surface layer.

Silt. (1) Small mineral soil grains that range in size from 0.05 millimeter (0.002 inch) to 0.002 millimeter (0.000079 inch) in diameter. (2) Sediments deposited by water in which the individual grains are approximately the size of silt, although the term is sometimes applied loosely to sediments containing considerable sand and clay. (See also Texture, soil.)

Soil. (1) The natural medium for the growth of land plants. (2) The collection of natural bodies occupying parts of the earth's surface that support plants and that have properties caused by the integrated effect of climate and living matter acting upon parent material, as conditioned by relief, over a period of time. (3) A dynamic natural body on the surface of the earth in which plants grow, composed of mineral and organic materials and living forms.

Solum. The upper part of a profile, above the parent material, in which the processes of soil formation are active. The solum in mature soils includes the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying parent material. The living roots and other kinds of plant and animal life characteristic of the soil are largely confined to the solum. (See also Profile, soil.)

Structure, soil. The arrangement of primary soil particles into aggregates with definite shape or pattern. Refers to the natural arrangement of the soil material when in place and undisturbed or to the soil at any degree of disturbance. *Crumb, granular, platy, prismatic, columnar, angular, subangular,* and *blocky* are terms used to describe soil structure.

Subsoil. Commonly, that part of the profile below plow depth. Technically, the B horizon.

Subsurface layer. Refers to that part of the A horizon below the surface soil. In soils that have weak profile development, the subsurface layer can be defined only in terms of arbitrary depths.

Surface layer, or surface soil. Commonly, that part of the soil that is moved in tillage, or its equivalent in uncultivated soil; about 5 to 8 inches in thickness. Technically, the A horizon.

Terrace, geologic. An old alluvial plain, generally flat or undulating, bordering a stream; frequently called second bottom, as contrasted with flood plain; seldom subject to overflow.

Texture, soil. The relative proportions of the various size groups of individual soil grains in a mass of soil. Specifically, the proportions of sand, silt, and clay in soil material. A coarse-textured soil is one that has a high content of sand; a fine-textured soil has a large proportion of clay. (See also Clay; Sand; and Silt.)

Tilth. The physical condition of a soil in respect to its fitness for growing a specified plant or sequence of plants.

Type, soil. A subdivision of a soil series based on the texture of the surface layer.

Upland (geologic). Land consisting of material unworked by water in recent geologic time and lying, in general, at a higher elevation than the alluvial plain or stream terrace.

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U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NORTH CAROLINA AGRICULTURAL EXPERIMENT STATION

GENERAL SOIL MAP
IREDELL COUNTY, NORTH CAROLINA

N

SOIL ASSOCIATIONS

1 — Cecil association: Deep, gently sloping to steep, well-drained soils with a subsoil of reddish clay, on granite, gneiss, and schist

2 — Lloyd-Cecil association: Deep, gently sloping to strongly sloping, well-drained soils with a subsoil of yellowish-red to dark-red clay, on gneiss and mixed acidic and basic rocks

3 — Lloyd association: Deep, well-drained soils with a subsoil of dark-red clay on broad ridges that have short side slopes, on mixed acidic and basic rocks

4 — Cecil-Appling association: Deep, gently sloping or sloping, well-drained soils with a subsoil of red or yellowish-red clay, on granite, gneiss, and schist

5 — Cecil-Madison association: Shallow to deep, strongly sloping to steep, well-drained soils that have a sandy or gravelly surface layer and a subsoil of yellowish-red to red clay, on gneiss and quartz mica schist

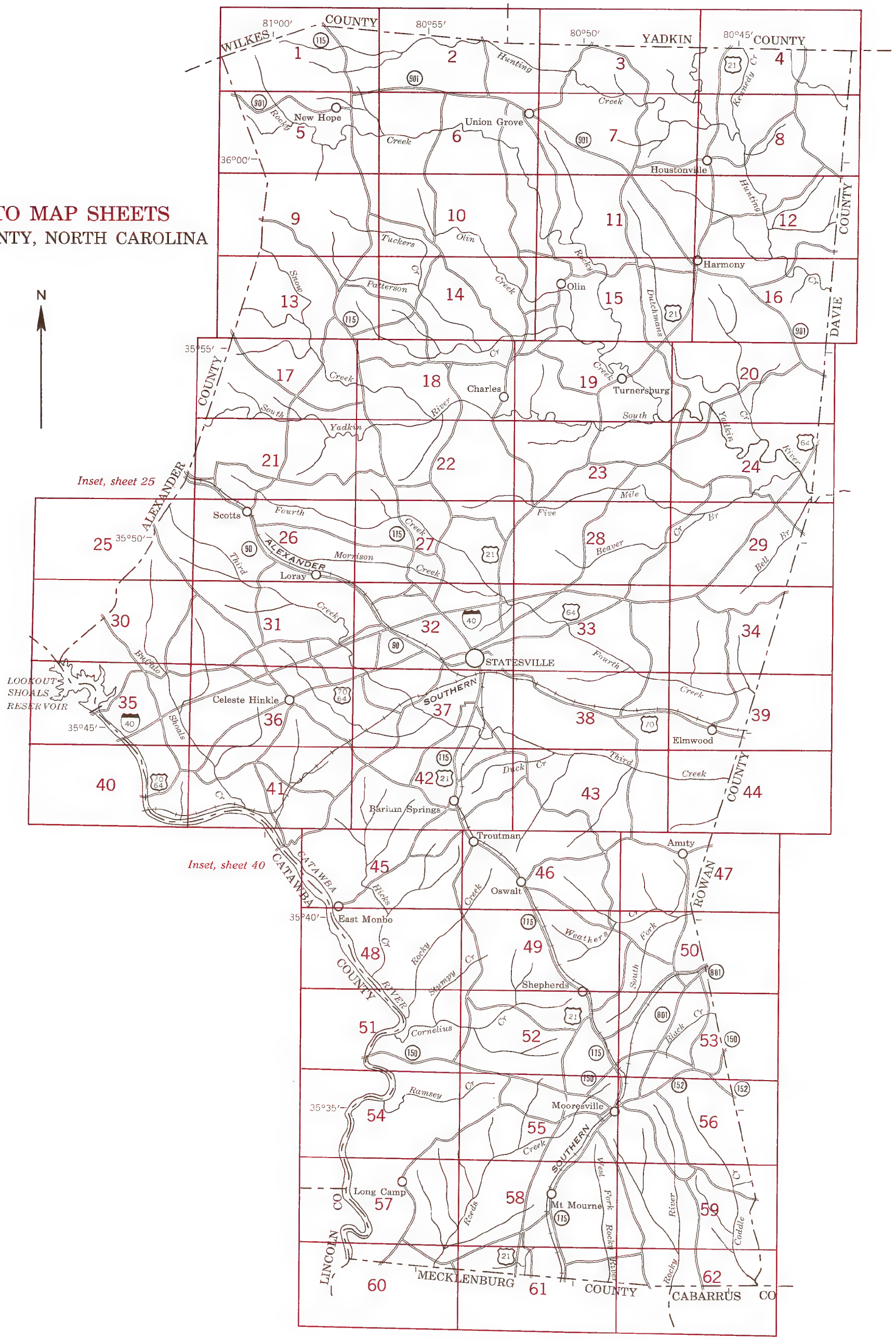
6 — Iredell-Mecklenburg-Lloyd association: Shallow to deep soils of broad ridges and short side slopes that have a subsoil of very firm, plastic clay or firm clay, on basic rocks or mixed acidic and basic rocks

7 — Cecil-Wilkes association: Deep to shallow, steep, stony soils of foothills, on mixed acidic and basic rocks or acidic rocks

February 1963

Scale 1:190,080
1 0 1 2 3 4 Miles

INDEX TO MAP SHEETS
IREDELL COUNTY, NORTH CAROLINA



SOIL LEGEND

The first capital letter is the initial one of the soil name. A second capital letter shows the slope. Symbols without a slope letter are those of nearly level soils such as Buncombe loamy sand, or of land types, that have a range of slope, such as Made land. A final number, 2 or 3, in the symbol, shows that the soil is named as eroded or severely eroded.

SYMBOL	NAME
AfB	Altavista fine sandy loam, 2 to 6 percent slopes
AfB2	Altavista fine sandy loam, 2 to 6 percent slopes, eroded
AmC3	Appling sandy clay loam, 6 to 10 percent slopes, severely eroded
AmD3	Appling sandy clay loam, 10 to 15 percent slopes, severely eroded
AsB	Appling sandy loam, 2 to 6 percent slopes
AsB2	Appling sandy loam, 2 to 6 percent slopes, eroded
AsC	Appling sandy loam, 6 to 10 percent slopes
AsC2	Appling sandy loam, 6 to 10 percent slopes, eroded
AsD	Appling sandy loam, 10 to 15 percent slopes
AsD2	Appling sandy loam, 10 to 15 percent slopes, eroded
AsE	Appling sandy loam, 15 to 25 percent slopes
AsE2	Appling sandy loam, 15 to 25 percent slopes, eroded
Bn	Buncombe loamy sand
CcB3	Cecil clay loam, 2 to 6 percent slopes, severely eroded
CcC3	Cecil clay loam, 6 to 10 percent slopes, severely eroded
CcD3	Cecil clay loam, 10 to 15 percent slopes, severely eroded
CcE3	Cecil clay loam, 15 to 25 percent slopes, severely eroded
CfB	Cecil fine sandy loam, 2 to 6 percent slopes
CfB2	Cecil fine sandy loam, 2 to 6 percent slopes, eroded
CfC	Cecil fine sandy loam, 6 to 10 percent slopes
CfC2	Cecil fine sandy loam, 6 to 10 percent slopes, eroded
CfD	Cecil fine sandy loam, 10 to 15 percent slopes
CfD2	Cecil fine sandy loam, 10 to 15 percent slopes, eroded
CgB	Cecil gravelly fine sandy loam, 2 to 6 percent slopes
CgB2	Cecil gravelly fine sandy loam, 2 to 6 percent slopes, eroded
CgC	Cecil gravelly fine sandy loam, 6 to 10 percent slopes
CgC2	Cecil gravelly fine sandy loam, 6 to 10 percent slopes, eroded
CgD	Cecil gravelly fine sandy loam, 10 to 15 percent slopes
CgD2	Cecil gravelly fine sandy loam, 10 to 15 percent slopes, eroded
CgE	Cecil gravelly fine sandy loam, 15 to 25 percent slopes
CgE2	Cecil gravelly fine sandy loam, 15 to 25 percent slopes, eroded
CmB	Cecil sandy loam, 2 to 6 percent slopes
CmB2	Cecil sandy loam, 2 to 6 percent slopes, eroded
CmC	Cecil sandy loam, 6 to 10 percent slopes
CmC2	Cecil sandy loam, 6 to 10 percent slopes, eroded
CmD	Cecil sandy loam, 10 to 15 percent slopes
CmD2	Cecil sandy loam, 10 to 15 percent slopes, eroded
CsE	Cecil soils, 15 to 25 percent slopes
CsE2	Cecil soils, 15 to 25 percent slopes, eroded
CsF	Cecil soils, 25 to 45 percent slopes
CsF2	Cecil soils, 25 to 45 percent slopes, eroded
CtD2	Cecil stony fine sandy loam, 6 to 15 percent slopes, eroded
CuE	Cecil stony fine sandy loam, shallow, 15 to 25 percent slopes
CuF	Cecil stony fine sandy loam, shallow, 25 to 55 percent slopes
Cw	Chewacla soils
CxB	Colfax sandy loam, 2 to 6 percent slopes
Cy	Congaree soils
DaB2	Davidson clay loam, 2 to 6 percent slopes, eroded
DaC2	Davidson clay loam, 6 to 10 percent slopes, eroded
HwB2	Hiwassee loam, 2 to 6 percent slopes, eroded
HwC2	Hiwassee loam, 6 to 10 percent slopes, eroded
IrB2	Iredell loam, 2 to 6 percent slopes, eroded
IrC2	Iredell loam, 6 to 10 percent slopes, eroded
LcB3	Lloyd clay loam, 2 to 6 percent slopes, severely eroded
LcC3	Lloyd clay loam, 6 to 10 percent slopes, severely eroded
LcD3	Lloyd clay loam, 10 to 15 percent slopes, severely eroded
LcE3	Lloyd clay loam, 15 to 25 percent slopes, severely eroded
LfB	Lloyd fine sandy loam, 2 to 6 percent slopes
LfB2	Lloyd fine sandy loam, 2 to 6 percent slopes, eroded
LfC	Lloyd fine sandy loam, 6 to 10 percent slopes
LfC2	Lloyd fine sandy loam, 6 to 10 percent slopes, eroded
LfD	Lloyd fine sandy loam, 10 to 15 percent slopes
LfD2	Lloyd fine sandy loam, 10 to 15 percent slopes, eroded
LfE	Lloyd fine sandy loam, 15 to 25 percent slopes
LfE2	Lloyd fine sandy loam, 15 to 25 percent slopes, eroded
LmB	Lloyd loam, 2 to 6 percent slopes
LmB2	Lloyd loam, 2 to 6 percent slopes, eroded
LmC	Lloyd loam, 6 to 10 percent slopes
LmC2	Lloyd loam, 6 to 10 percent slopes, eroded
LmD	Lloyd loam, 10 to 15 percent slopes
LmD2	Lloyd loam, 10 to 15 percent slopes, eroded
LmE	Lloyd loam, 15 to 25 percent slopes
LmE2	Lloyd loam, 15 to 25 percent slopes, eroded
Lo	Local alluvial land
LuC	Louisburg and Louisa soils, 6 to 10 percent slopes
LuD	Louisburg and Louisa soils, 10 to 15 percent slopes
LuE	Louisburg and Louisa soils, 15 to 25 percent slopes
LuF	Louisburg and Louisa soils, 25 to 55 percent slopes
Ma	Made land
MdB	Madison gravelly fine sandy loam, 2 to 6 percent slopes
MdB2	Madison gravelly fine sandy loam, 2 to 6 percent slopes, eroded
MdC	Madison gravelly fine sandy loam, 6 to 10 percent slopes
MdC2	Madison gravelly fine sandy loam, 6 to 10 percent slopes, eroded
MdD	Madison gravelly fine sandy loam, 10 to 15 percent slopes
MdD2	Madison gravelly fine sandy loam, 10 to 15 percent slopes, eroded
MdE	Madison gravelly fine sandy loam, 15 to 25 percent slopes
MdE2	Madison gravelly fine sandy loam, 15 to 25 percent slopes, eroded
MdF	Madison gravelly fine sandy loam, 25 to 45 percent slopes
MfB2	Mayodan sandy loam, 2 to 6 percent slopes, eroded
MhD3	Mecklenburg clay loam, 6 to 15 percent slopes, severely eroded
MkB2	Mecklenburg loam, 2 to 6 percent slopes, eroded
MkC2	Mecklenburg loam, 6 to 10 percent slopes, eroded
MkD2	Mecklenburg loam, 10 to 15 percent slopes, eroded
Mm	Mixed alluvial land
Mn	Mixed alluvial land, wet
MoC	Moderately gullied land, rolling
MoD	Moderately gullied land, hilly
Sg	Severely gullied land
St	Starr loam
Wa	Warne and Roanoke fine sandy loams
We	Wehadkee silt loam
WfB	Wickham fine sandy loam, 2 to 6 percent slopes
WfB2	Wickham fine sandy loam, 2 to 6 percent slopes, eroded
WfC2	Wickham fine sandy loam, 6 to 10 percent slopes, eroded
WkC	Wilkes soils, 6 to 10 percent slopes
WkD	Wilkes soils, 10 to 15 percent slopes
WkE	Wilkes soils, 15 to 25 percent slopes
WkF	Wilkes soils, 25 to 55 percent slopes
Wo	Worsham loam

CONVENTIONAL SIGNS

WORKS AND STRUCTURES

Highways and roads
- Dual
- Good motor
- Poor motor
- Trail

Highway markers
- National Interstate
- U. S.
- State

Railroads
- Single track
- Multiple track
- Abandoned

Bridges and crossings
- Road
- Trail, foot
- Railroad
- Ferries
- Ford
- Grade
- R. R. over
- R. R. under
- Tunnel

Buildings
- School
- Church
- Summer or winter cottage

Mines and Quarries
- Mine dump
- Pits, gravel or other

Power lines

Pipe lines

Cemeteries

Dams

Levees

Tanks

Forest fire or lookout station

BOUNDARIES

- National or state
- County
- Township, U. S.
- Section line, corner
- Reservation
- Land grant

DRAINAGE

Streams
- Perennial
- Intermittent, unclass.

Canals and ditches — CANAL / DITCH

Lakes and ponds
- Perennial
- Intermittent

Wells — flowing

Springs

Marsh

Wet spot

Approximate full pond shoreline of proposed Lake Norman

RELIEF

Escarpments
- Bedrock
- Other

Prominent peaks

Depressions

	Large	Small
Crossable with tillage implements		
Not crossable with tillage implements		
Contains water most of the time		

SOIL SURVEY DATA

- Soil boundary and symbol — Dx
- Gravel
- Stones
- Rock outcrops
- Chert fragments
- Clay spot
- Sand spot
- Gumbo or scabby spot
- Made land
- Severely eroded spot
- Blowout, wind erosion
- Gullies

Soil map constructed 1963 by Cartographic Division, Soil Conservation Service, USDA, from 1956 aerial photographs. Controlled mosaic based on North Carolina plane coordinate system, Lambert conformal conic projection. 1927 North American datum.

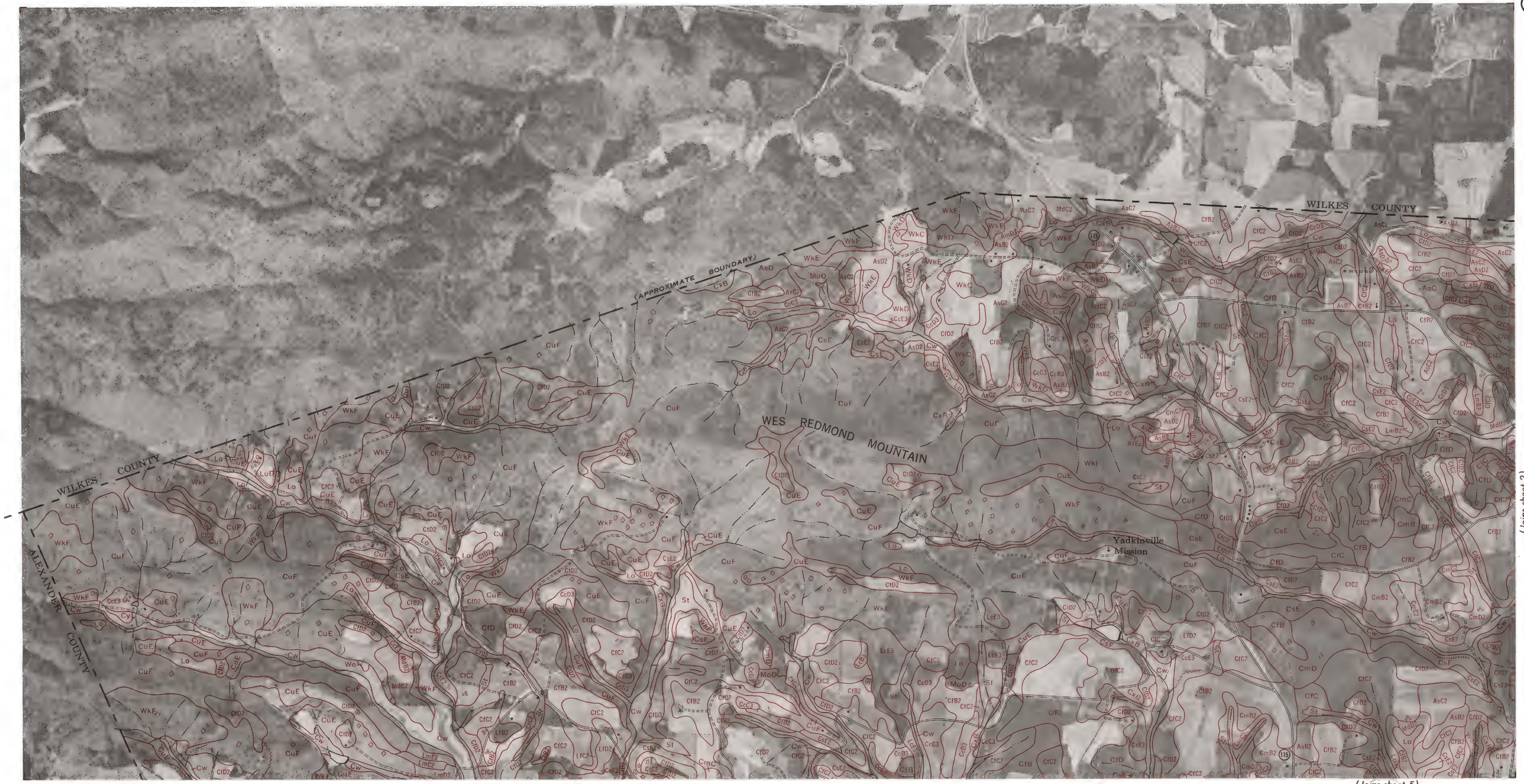
GUIDE TO MAPPING UNITS

[See table 8, p. 50, for the acreage and proportionate extent of the soils, and table 1, p. 18, for the estimated yields. To find the engineering properties of the soils, see the section beginning on p. 32. Dashes show that Made land was neither given a capability classification nor placed in a woodland group, because the soil material is too variable]

Map symbol	Soil name	Page	Capability unit	Page	Woodland group	Page
			Symbol		Symbol	
AfB	Altavista fine sandy loam, 2 to 6 percent slopes	52	IIe–1	7	3A	27
AfB2	Altavista fine sandy loam, 2 to 6 percent slopes, eroded	52	IIe–1	7	3B	27
AmC3	Appling sandy clay loam, 6 to 10 percent slopes, severely eroded	54	IVe–2	14	4C	28
AmD3	Appling sandy clay loam, 10 to 15 percent slopes, severely eroded	54	VIe–2	17	4C	28
AsB	Appling sandy loam, 2 to 6 percent slopes	53	IIe–1	7	4A	27
AsB2	Appling sandy loam, 2 to 6 percent slopes, eroded	53	IIe–1	7	4B	28
AsC	Appling sandy loam, 6 to 10 percent slopes	53	IIIe–1	10	4A	27
AsC2	Appling sandy loam, 6 to 10 percent slopes, eroded	53	IIIe–1	10	4B	28
AsD	Appling sandy loam, 10 to 15 percent slopes	54	IVe–1	13	4A	27
AsD2	Appling sandy loam, 10 to 15 percent slopes, eroded	54	IVe–1	13	4B	28
AsE	Appling sandy loam, 15 to 25 percent slopes	54	VIe–1	16	4A	27
AsE2	Appling sandy loam, 15 to 25 percent slopes, eroded	54	VIe–1	16	4B	28
Bn	Buncombe loamy sand	55	IIIs–1	13	8	29
CcB3	Cecil clay loam, 2 to 6 percent slopes, severely eroded	62	IIIe–2	10	4C	28
CcC3	Cecil clay loam, 6 to 10 percent slopes, severely eroded	61	IVe–2	14	4C	28
CcD3	Cecil clay loam, 10 to 15 percent slopes, severely eroded	62	VIe–2	17	4C	28
CcE3	Cecil clay loam, 15 to 25 percent slopes, severely eroded	62	VIIe–2	18	4C	28
CfB	Cecil fine sandy loam, 2 to 6 percent slopes	55	IIe–1	7	4A	27
CfB2	Cecil fine sandy loam, 2 to 6 percent slopes, eroded	56	IIe–1	7	4B	28
CfC	Cecil fine sandy loam, 6 to 10 percent slopes	56	IIIe–1	10	4A	27
CfC2	Cecil fine sandy loam, 6 to 10 percent slopes, eroded	56	IIIe–1	10	4B	28
CfD	Cecil fine sandy loam, 10 to 15 percent slopes	57	IVe–1	13	4A	27
CfD2	Cecil fine sandy loam, 10 to 15 percent slopes, eroded	57	IVe–1	13	4B	28
CgB	Cecil gravelly fine sandy loam, 2 to 6 percent slopes	59	IIe–1	7	4A	27
CgB2	Cecil gravelly fine sandy loam, 2 to 6 percent slopes, eroded	59	IIe–1	7	4B	28
CgC	Cecil gravelly fine sandy loam, 6 to 10 percent slopes	59	IIIe–1	10	4A	27
CgC2	Cecil gravelly fine sandy loam, 6 to 10 percent slopes, eroded	60	IIIe–1	10	4B	28
CgD	Cecil gravelly fine sandy loam, 10 to 15 percent slopes	60	IVe–1	13	4A	27
CgD2	Cecil gravelly fine sandy loam, 10 to 15 percent slopes, eroded	60	IVe–1	13	4B	28
CgE	Cecil gravelly fine sandy loam, 15 to 25 percent slopes	60	VIe–1	16	4A	27
CgE2	Cecil gravelly fine sandy loam, 15 to 25 percent slopes, eroded	60	VIe–1	16	4B	28
CmB	Cecil sandy loam, 2 to 6 percent slopes	58	IIe–1	7	4A	27
CmB2	Cecil sandy loam, 2 to 6 percent slopes, eroded	58	IIe–1	7	4B	28
CmC	Cecil sandy loam, 6 to 10 percent slopes	58	IIIe–1	10	4A	27
CmC2	Cecil sandy loam, 6 to 10 percent slopes, eroded	58	IIIe–1	10	4B	28
CmD	Cecil sandy loam, 10 to 15 percent slopes	58	IVe–1	13	4A	27
CmD2	Cecil sandy loam, 10 to 15 percent slopes, eroded	58	IVe–1	13	4B	28
CsE	Cecil soils, 15 to 25 percent slopes	58	VIe–1	16	4A	27
CsE2	Cecil soils, 15 to 25 percent slopes, eroded	59	VIe–1	16	4B	28
CsF	Cecil soils, 25 to 45 percent slopes	59	VIIe–1	17	4A	27
CsF2	Cecil soils, 25 to 45 percent slopes, eroded	59	VIIe–1	17	4B	28
CtD2	Cecil stony fine sandy loam, 6 to 15 percent slopes, eroded	60	IVe–1	13	4B	28
CuE	Cecil stony fine sandy loam, shallow, 15 to 25 percent slopes	61	VIe–1	16	4A	27
CuF	Cecil stony fine sandy loam, shallow, 25 to 55 percent slopes	61	VIIe–1	17	4A	27
Cw	Chewacla soils	62	IIIw–1	12	1	26
CxB	Colfax sandy loam, 2 to 6 percent slopes	63	IIIw–2	12	3A	27
Cy	Congaree soils	64	IIw–1	9	1	26
DaB2	Davidson clay loam, 2 to 6 percent slopes, eroded	64	IIe–2	8	4B	28
DaC2	Davidson clay loam, 6 to 10 percent slopes, eroded	65	IIIe–2	10	4B	28
HwB2	Hiwassee loam, 2 to 6 percent slopes, eroded	65	IIe–2	8	4B	28
HwC2	Hiwassee loam, 6 to 10 percent slopes, eroded	66	IIIe–2	10	4B	28
IrB2	Iredell loam, 2 to 6 percent slopes, eroded	66	IIe–3	9	7	29
IrC2	Iredell loam, 6 to 10 percent slopes, eroded	67	IVe–3	15	7	29
LcB3	Lloyd clay loam, 2 to 6 percent slopes, severely eroded	70	IIIe–2	10	4C	28
LcC3	Lloyd clay loam, 6 to 10 percent slopes, severely eroded	70	IVe–2	14	4C	28
LcD3	Lloyd clay loam, 10 to 15 percent slopes, severely eroded	70	VIe–2	17	4C	28
LcE3	Lloyd clay loam, 15 to 25 percent slopes, severely eroded	70	VIIe–2	18	4C	28
LfB	Lloyd fine sandy loam, 2 to 6 percent slopes	69	IIe–1	7	4A	27
LfB2	Lloyd fine sandy loam, 2 to 6 percent slopes, eroded	69	IIe–1	7	4B	28
LfC	Lloyd fine sandy loam, 6 to 10 percent slopes	69	IIIe–1	10	4A	27
LfC2	Lloyd fine sandy loam, 6 to 10 percent slopes, eroded	69	IIIe–1	10	4B	28
LfD	Lloyd fine sandy loam, 10 to 15 percent slopes	69	IVe–1	13	4A	27
LfD2	Lloyd fine sandy loam, 10 to 15 percent slopes, eroded	69	IVe–1	13	4B	28
LfE	Lloyd fine sandy loam, 15 to 25 percent slopes	70	VIe–1	16	4A	27
LfE2	Lloyd fine sandy loam, 15 to 25 percent slopes, eroded	70	VIe–1	16	4B	28
LmB	Lloyd loam, 2 to 6 percent slopes	67	IIe–2	8	4A	27
LmB2	Lloyd loam, 2 to 6 percent slopes, eroded	68	IIe–2	8	4B	28
LmC	Lloyd loam, 6 to 10 percent slopes	68	IIIe–2	10	4A	27
LmC2	Lloyd loam, 6 to 10 percent slopes, eroded	68	IIIe–2	10	4B	28
LmD	Lloyd loam, 10 to 15 percent slopes	68	IVe–2	14	4A	27
LmD2	Lloyd loam, 10 to 15 percent slopes, eroded	68	IVe–2	14	4B	28
LmE	Lloyd loam, 15 to 25 percent slopes	68	VIe–1	16	4A	27
LmE2	Lloyd loam, 15 to 25 percent slopes, eroded	69	VIe–1	16	4B	28
Lo	Local alluvial land	71	IIe–1	7	1	26
LuC	Louisburg and Louisa soils, 6 to 10 percent slopes	72	IVe–3	15	6	29
LuD	Louisburg and Louisa soils, 10 to 15 percent slopes	72	VIe–3	17	6	29
LuE	Louisburg and Louisa soils, 15 to 25 percent slopes	72	VIIe–1	17	6	29
LuF	Louisburg and Louisa soils, 25 to 55 percent slopes	71	VIIe–1	17	6	29
Ma	Made land	72	----------		--------	
MdB	Madison gravelly fine sandy loam, 2 to 6 percent slopes	73	IIe–1	7	4A	27
MdB2	Madison gravelly fine sandy loam, 2 to 6 percent slopes, eroded	73	IIe–1	7	4B	28
MdC	Madison gravelly fine sandy loam, 6 to 10 percent slopes	73	IIIe–1	10	4A	27
MdC2	Madison gravelly fine sandy loam, 6 to 10 percent slopes, eroded	73	IIIe–1	10	4B	28
MdD	Madison gravelly fine sandy loam, 10 to 15 percent slopes	74	IVe–1	13	4A	27
MdD2	Madison gravelly fine sandy loam, 10 to 15 percent slopes, eroded	74	IVe–1	13	4B	28
MdE	Madison gravelly fine sandy loam, 15 to 25 percent slopes	74	VIe–1	16	4A	27
MdE2	Madison gravelly fine sandy loam, 15 to 25 percent slopes, eroded	74	VIe–1	16	4B	28
MdF	Madison gravelly fine sandy loam, 25 to 45 percent slopes	74	VIIe–1	17	4A	27
MfB2	Mayodan sandy loam, 2 to 6 percent slopes, eroded	74	IIe–1	7	4B	28
MhD3	Mecklenburg clay loam, 6 to 15 percent slopes, severely eroded	76	IVe–3	15	5B	28
MkB2	Mecklenburg loam, 2 to 6 percent slopes, eroded	75	IIe–3	9	5A	28
MkC2	Mecklenburg loam, 6 to 10 percent slopes, eroded	76	IIIe–3	11	5A	28
MkD2	Mecklenburg loam, 10 to 15 percent slopes, eroded	76	IVe–3	15	5A	28
Mm	Mixed alluvial land	76	IIw–1	9	1	26
Mn	Mixed alluvial land, wet	76	IVw–1	15	2	27
MoC	Moderately gullied land, rolling	77	VIIe–2	18	9	29
MoD	Moderately gullied land, hilly	77	VIIe–2	18	9	29
Sg	Severely gullied land	77	VIIe–2	18	9	29
St	Starr loam	78	IIe–2	8	1	26
Wa	Warne and Roanoke fine sandy loams	78	IIIw–2	12	2	27
We	Wehadkee silt loam	79	IVw–1	15	2	27
WfB	Wickham fine sandy loam, 2 to 6 percent slopes	81	IIe–1	7	4A	27
WfB2	Wickham fine sandy loam, 2 to 6 percent slopes, eroded	80	IIe–1	7	4B	28
WfC2	Wickham fine sandy loam, 6 to 10 percent slopes, eroded	81	IIIe–1	10	4B	28
WkC	Wilkes soils, 6 to 10 percent slopes	81	IVe–3	15	6	29
WkD	Wilkes soils, 10 to 15 percent slopes	81	VIe–3	17	6	29
WkE	Wilkes soils, 15 to 25 percent slopes	82	VIIe–1	17	6	29
WkF	Wilkes soils, 25 to 55 percent slopes	82	VIIe–1	17	6	29
Wo	Worsham loam	82	IVw–2	16	2	27

682-958 O - 64 (Face p. 96)

IREDELL COUNTY, NORTH CAROLINA — SHEET NUMBER 1



This map is one of a set compiled in 1963 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the North Carolina Agricultural Experiment Station.

0 ½ 1 Mile

Scale 1:15 840

0 5000 Feet

N

1

IREDELL COUNTY, NORTH CAROLINA — SHEET NUMBER 2

(2)

N

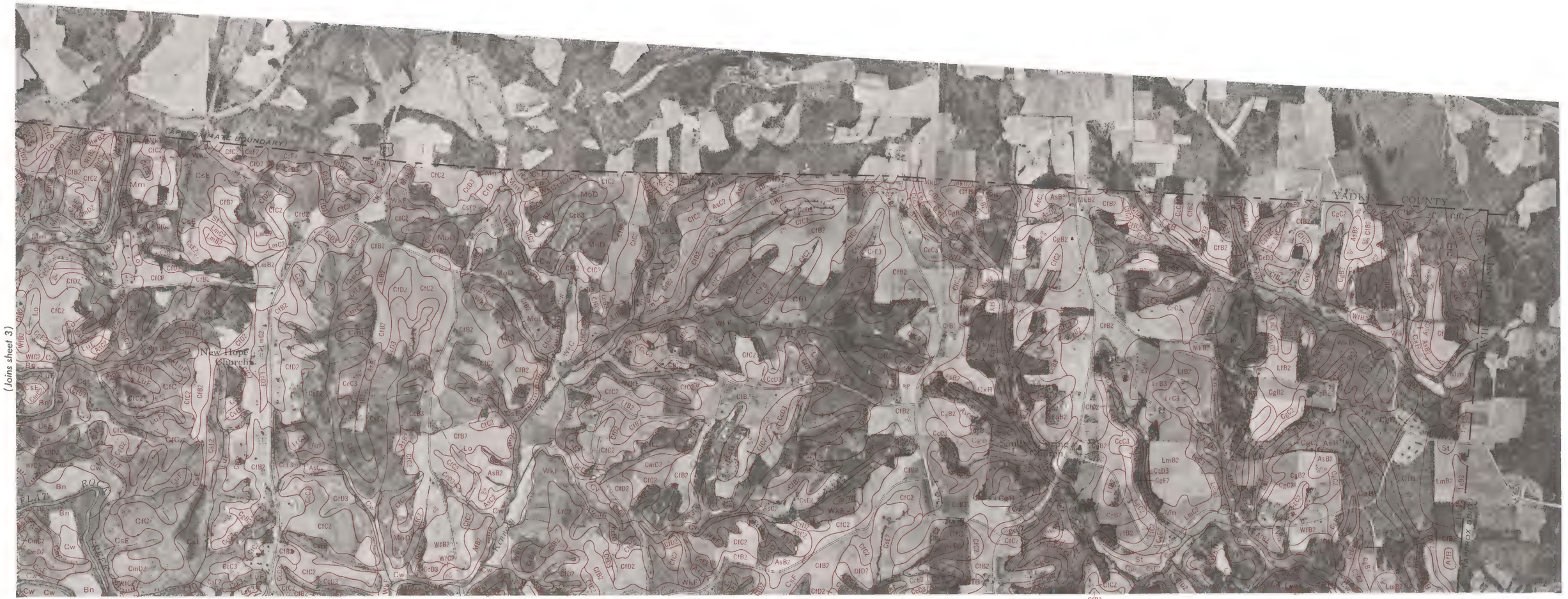
0 ½ 1 Mile

Scale 1:15 840

0 5000 Feet

4

N



0 ½ 1 Mile

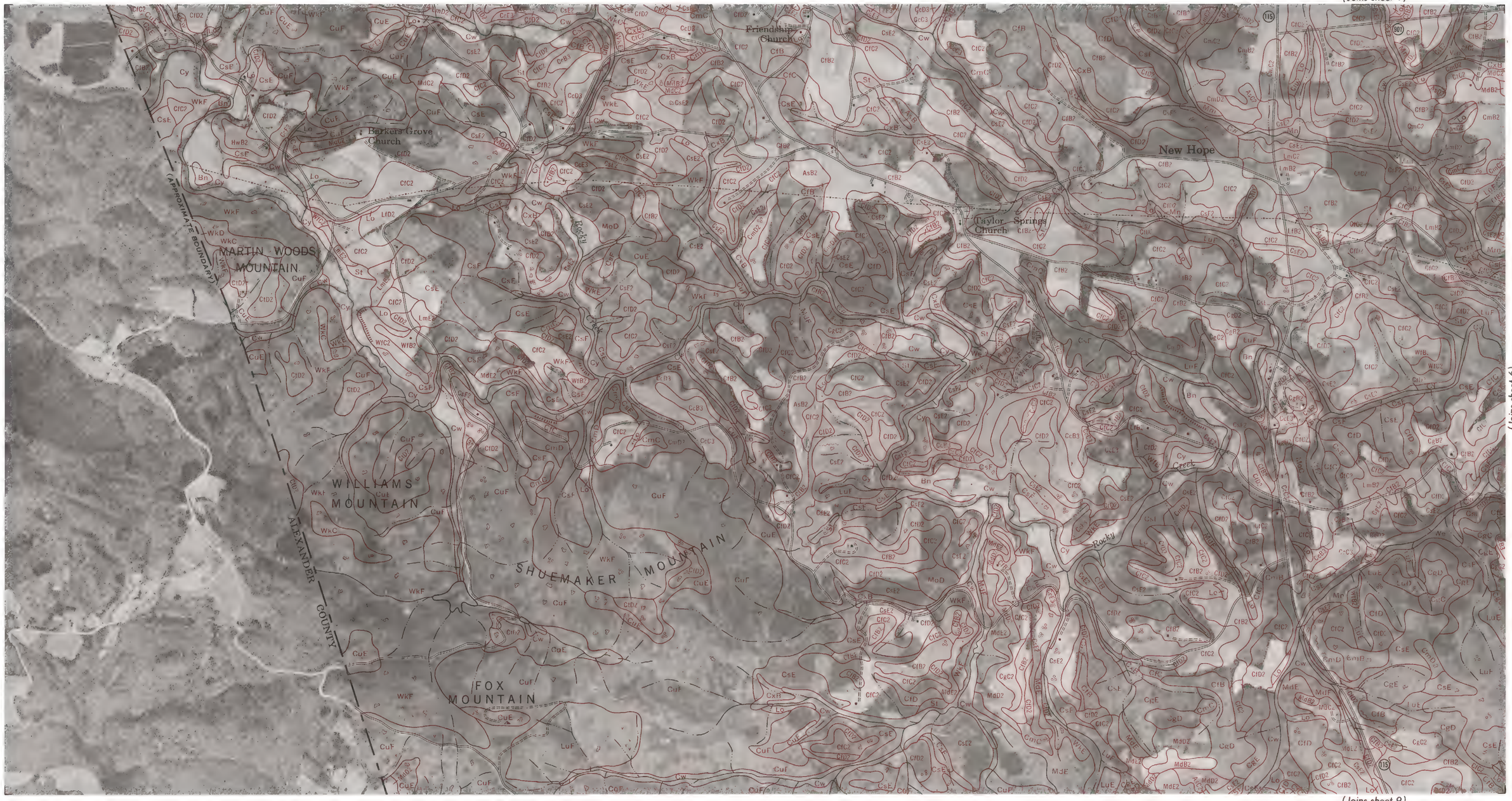
Scale 1:15 840

0 5000 Feet

IREDELL COUNTY, NORTH CAROLINA — SHEET NUMBER 5

(Joins sheet 1)

5



N

(Joins sheet 6)

(Joins sheet 9)

0 ½ 1 Mile

Scale 1:15 840

0 5000 Feet

IREDELL COUNTY, NORTH CAROLINA — SHEET NUMBER 6

IREDELL COUNTY, NORTH CAROLINA — SHEET NUMBER 7

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IREDELL COUNTY, NORTH CAROLINA — SHEET NUMBER 8

8

(Joins sheet 4)

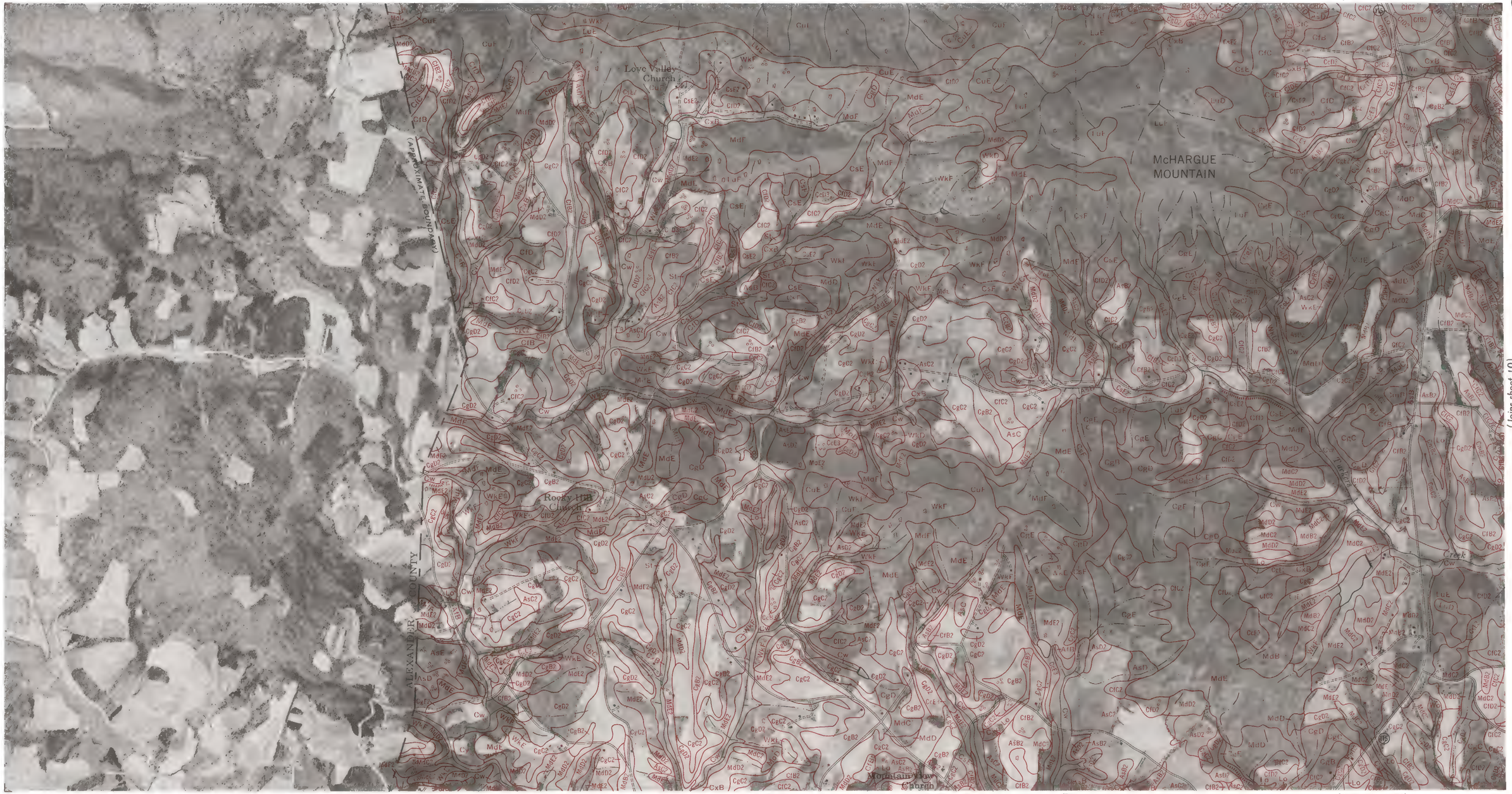
(Joins sheet 12)

0 ½ 1 Mile

Scale 1:15 840

0 5000 Feet

(Joins sheet 5)



(Joins sheet 10)

(Joins sheet 13)

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

IREDELL COUNTY, NORTH CAROLINA — SHEET NUMBER 10

(Joins sheet 6)

(Joins sheet 9)

(Joins sheet 11)

(Joins sheet 14)

0 ½ 1 Mile

Scale 1:15 840

0 5000 Feet

(Joins sheet 7)

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(12)

0 ½ 1 Mile

Scale 1:15 840

0 5000 Feet

(Joins sheet 9) CgD2

(Joins sheet 14)

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

(Joins sheet 17) | (Joins sheet 18)

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

(Joins sheet 11)

15

(Joins sheet 14)

(Joins sheet 16)

(Joins sheet 19) | (Joins sheet 20)

16

(Joins sheet 12)

N

(Joins sheet 15)

(Joins sheet 20)

0 ½ 1 Mile

Scale 1:15 840

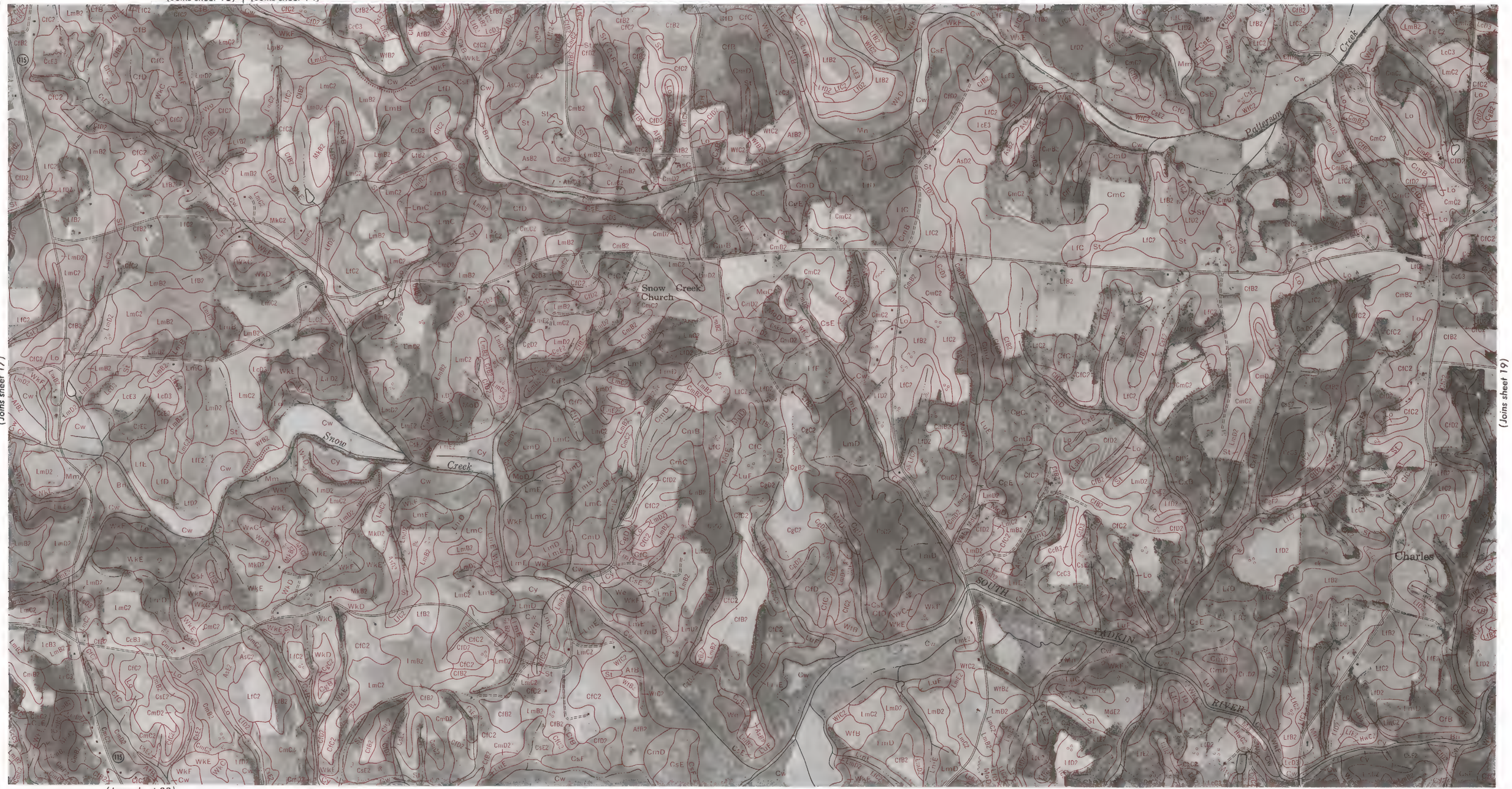
0 5000 Feet

(Joins sheet 13)

(Joins sheet 18)

(Joins sheet 21)

(Joins sheet 13) | (Joins sheet 14)



(Joins sheet 17)

(Joins sheet 19)

(Joins sheet 22)

0 ½ 1 Mile

Scale 1:15 840

0 5000 Feet

(Joins sheet 14) | (Joins sheet 15)

(Joins sheet 18)

(Joins sheet 20)

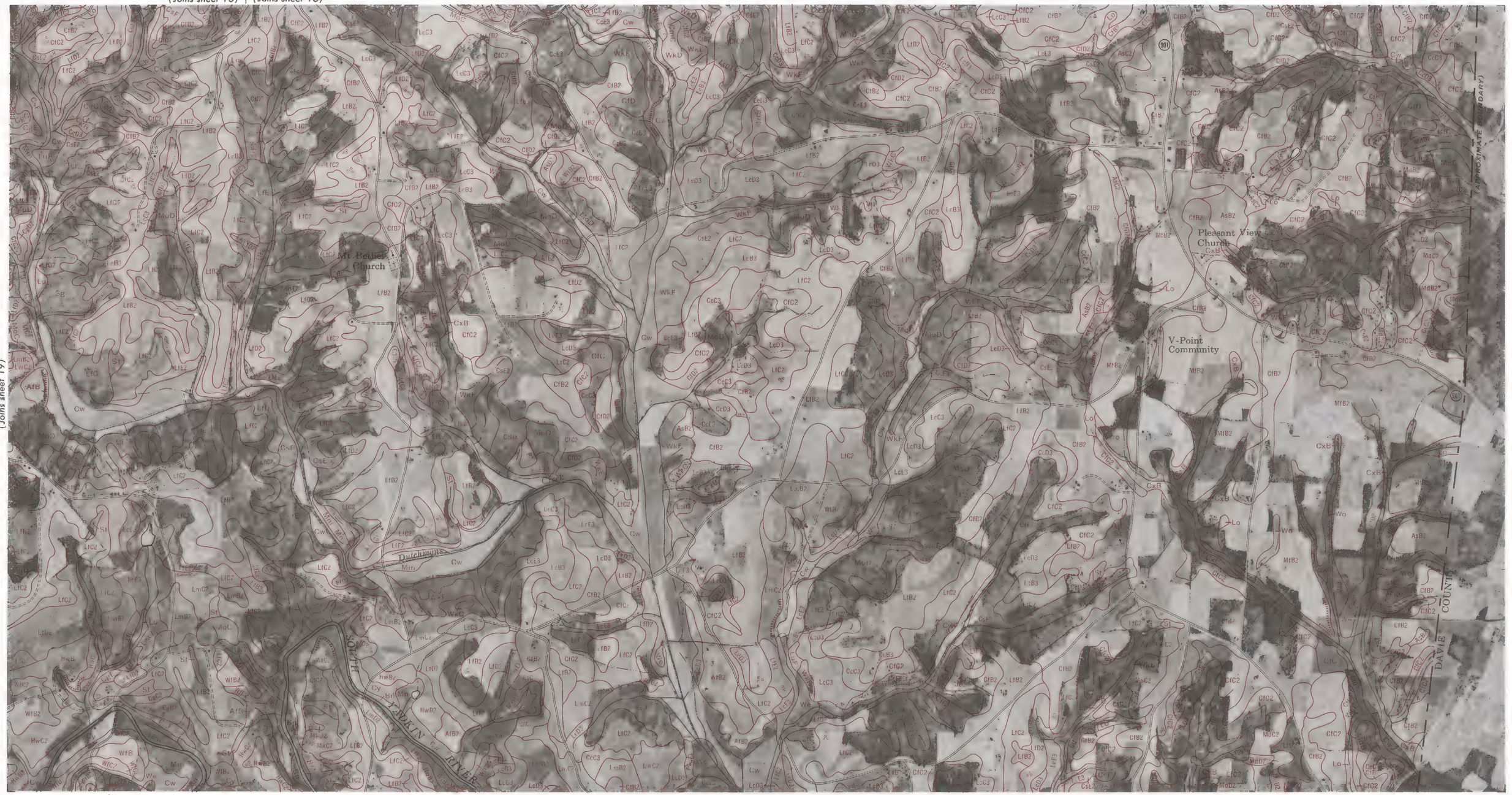
(Joins sheet 23)

(20)

(Joins sheet 15) | (Joins sheet 16)

N

(Joins sheet 19)



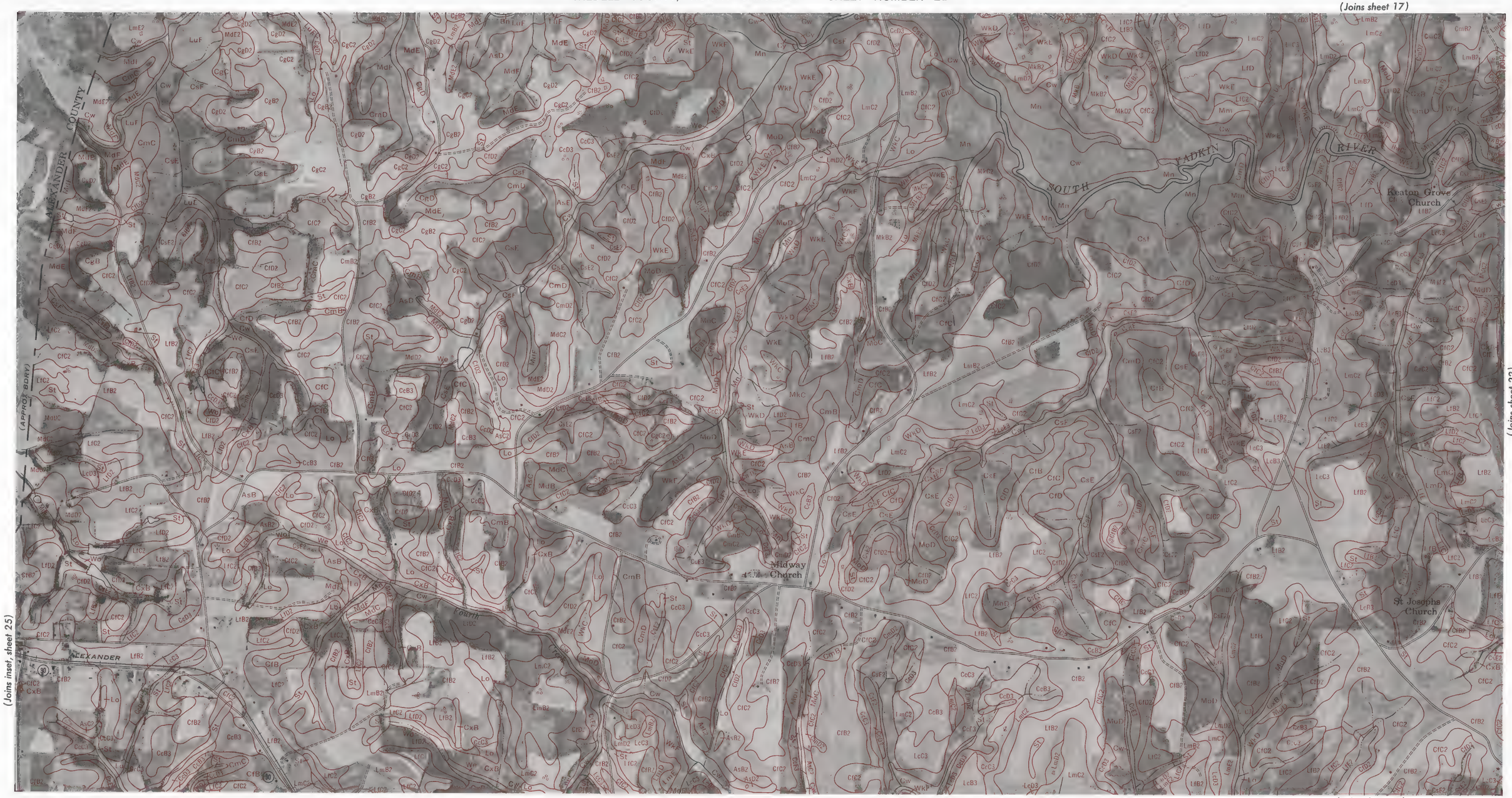
(Joins sheet 24)

0 ½ 1 Mile

Scale 1:15 840

0 5000 Feet

(Joins sheet 17)



(Joins inset, sheet 25)

(Joins sheet 22)

(Joins sheet 26)

0 ½ 1 Mile

Scale 1:15 840

0 5000 Feet

(22)

(Joins sheet 18)

(Joins sheet 21)

(Joins sheet 23)

(Joins sheet 27)

N

0 ½ 1 Mile

Scale 1:15 840

0 5000 Feet

(Joins sheet 19)

(Joins sheet 22)

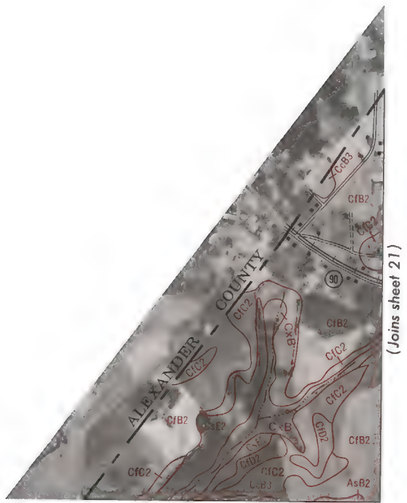
(Joins sheet 24)

(Joins sheet 28)

N

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

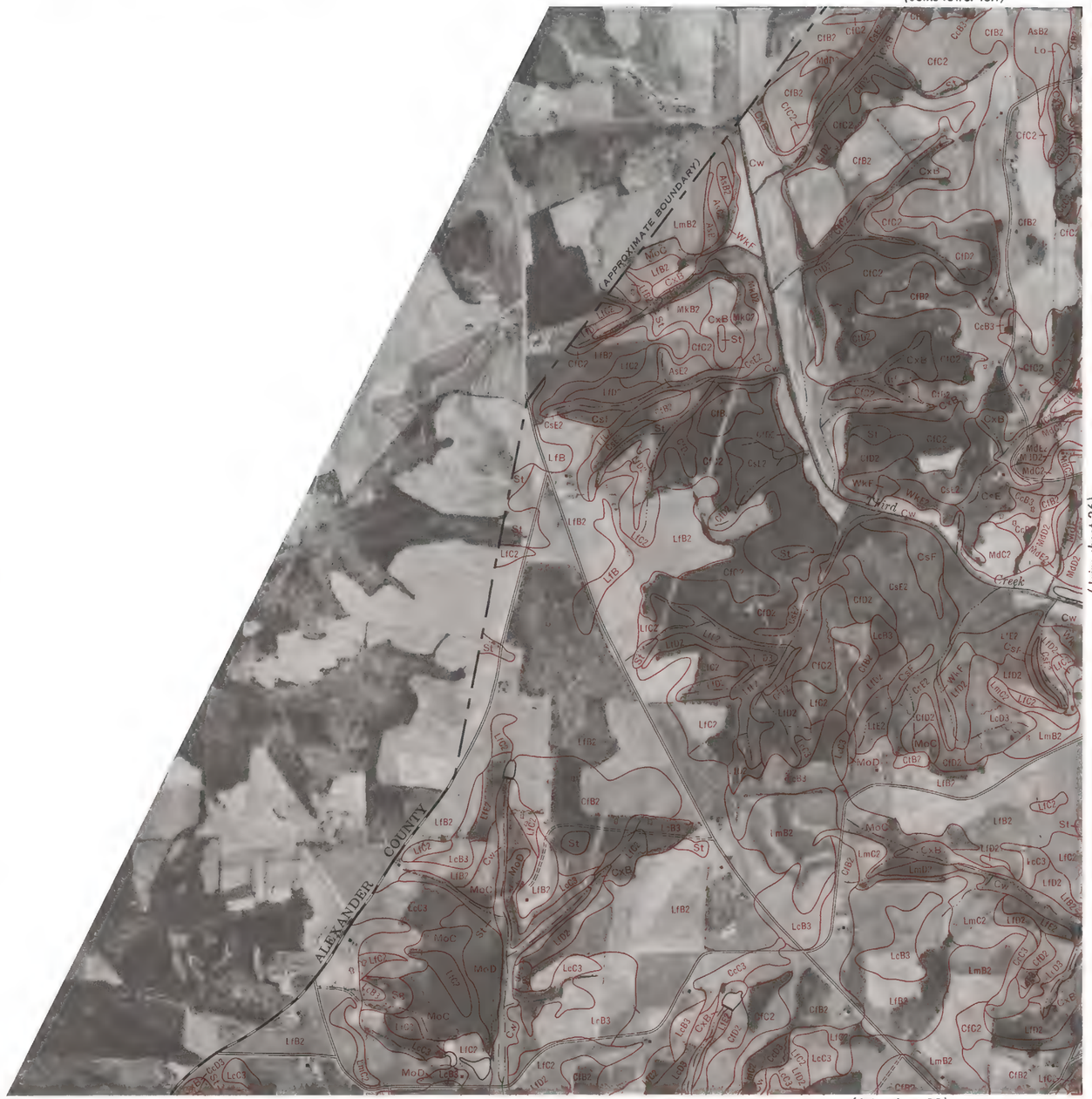

24
(Joins sheet 20)
N
(Joins sheet 23)
(Joins sheet 29)
SOUTH YADKIN RIVER
Dutchmans Creek
New Hope Church
Chestnut Grove Church
Cool Springs Church
Society Church
DAVIE COUNTY
(APPROXIMATE BOUNDARY)
64
0 ½ 1 Mile
Scale 1:15 840
0 5000 Feet



(Joins upper right)

(Joins sheet 21)

(Joins lower left)



(Joins sheet 26)

(Joins sheet 30)

25

N

0 ½ 1 Mile

Scale 1:15 840 0 5000 Feet

(26)

(Joins sheet 21)

(Joins sheet 25)

(Joins sheet 27)

(Joins sheet 31)

0 ½ 1 Mile

Scale 1:15 840

0 5000 Feet

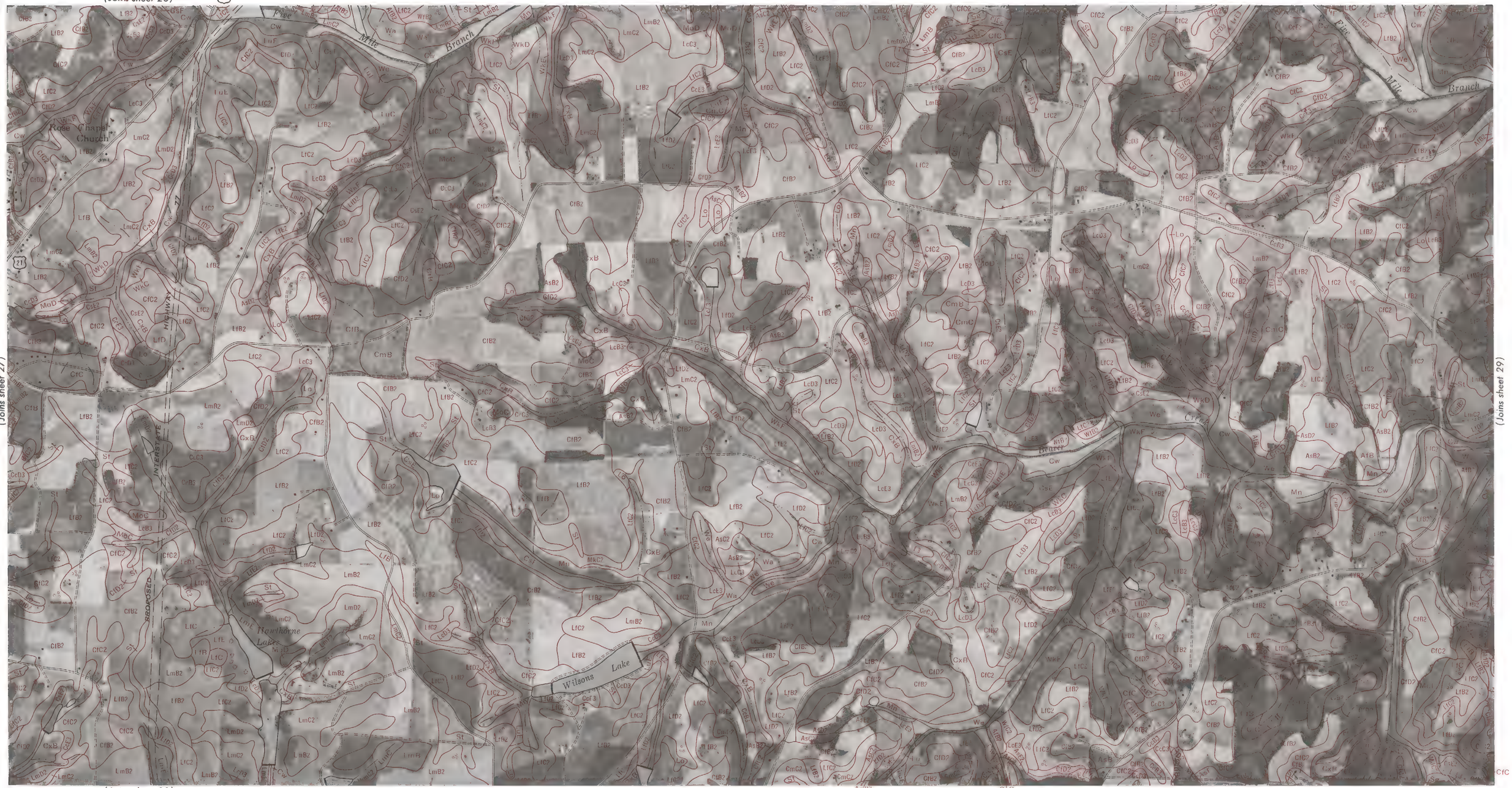
(Joins sheet 22)

(Joins sheet 26)

(Joins sheet 28)

(Joins sheet 32)

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet


28
N
(Joins sheet 23)
(Joins sheet 27)
(Joins sheet 29)
(Joins sheet 33)
Rose Chapel Church
Fire Mile Branch
Beaver Cw
Hawthorne Lakes
Wilsons Lake
INTERSTATE HIGHWAY
PROPOSED
0 ½ 1 Mile
Scale 1:15 840
0 5000 Feet

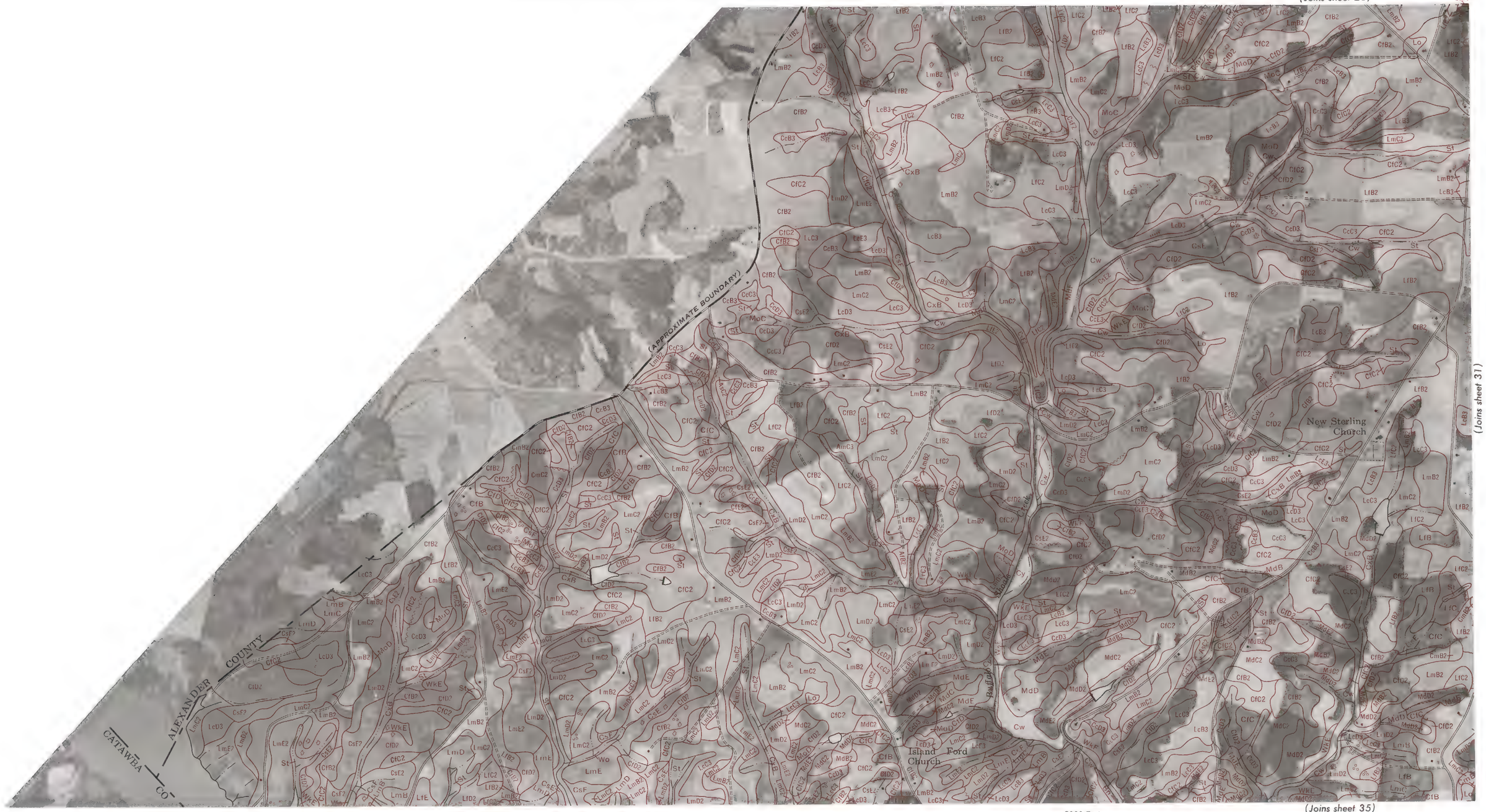
(Joins sheet 24)

(Joins sheet 28)

(Joins sheet 34)

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

IREDELL COUNTY, NORTH CAROLINA — SHEET NUMBER 30



(Joins sheet 26)

(Joins sheet 30)

(Joins sheet 32)

(Joins sheet 36)

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32

N

(Joins sheet 27)

(Joins sheet 31)

(Joins sheet 33)

(Joins sheet 37)

0 ½ 1 Mile

Scale 1:15 840

0 5000 Feet

(Joins sheet 28)

(Joins sheet 32)

(Joins sheet 34)

(Joins sheet 38)

(34)

(Joins sheet 29)

N

(Joins sheet 33)

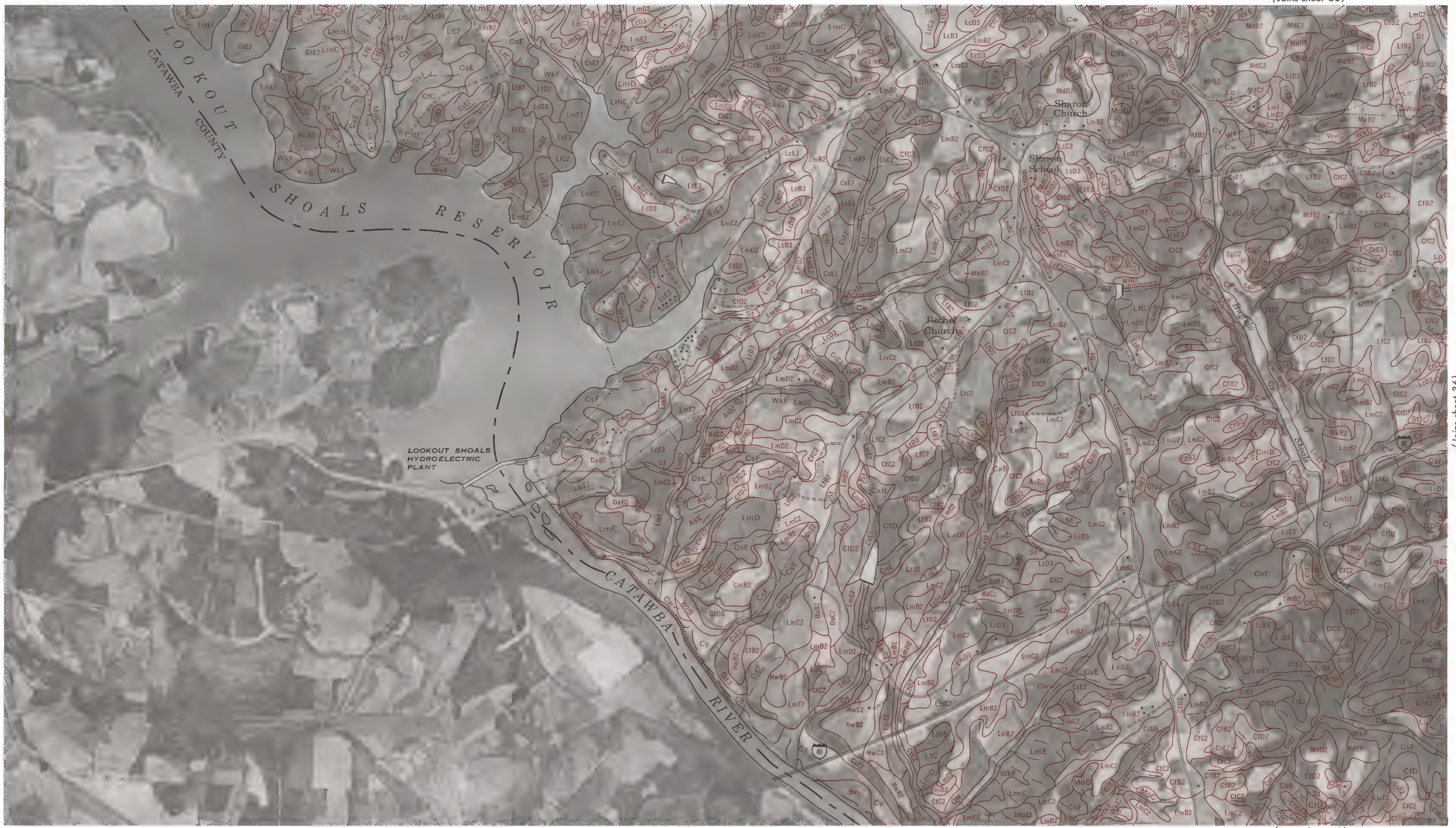
(Joins sheet 39)

0 ½ 1 Mile

Scale 1:15 840

0 5000 Feet

(Joins sheet 30)



(Joins sheet 36)

(Joins sheet 40)

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet


(36)
(Joins sheet 31)
N
(Joins sheet 35)
(Joins sheet 37)
(Joins sheet 41)
Fiedlh Church
Celeste Hinkle
STATESVILLE AIRPORT
Hinkle School
Bethlehem Church
Providence Church
0
½
1 Mile
Scale 1:15 840
0
5000 Feet

(Joins sheet 32)

(Joins sheet 36)

(Joins sheet 38)

(Joins sheet 42)

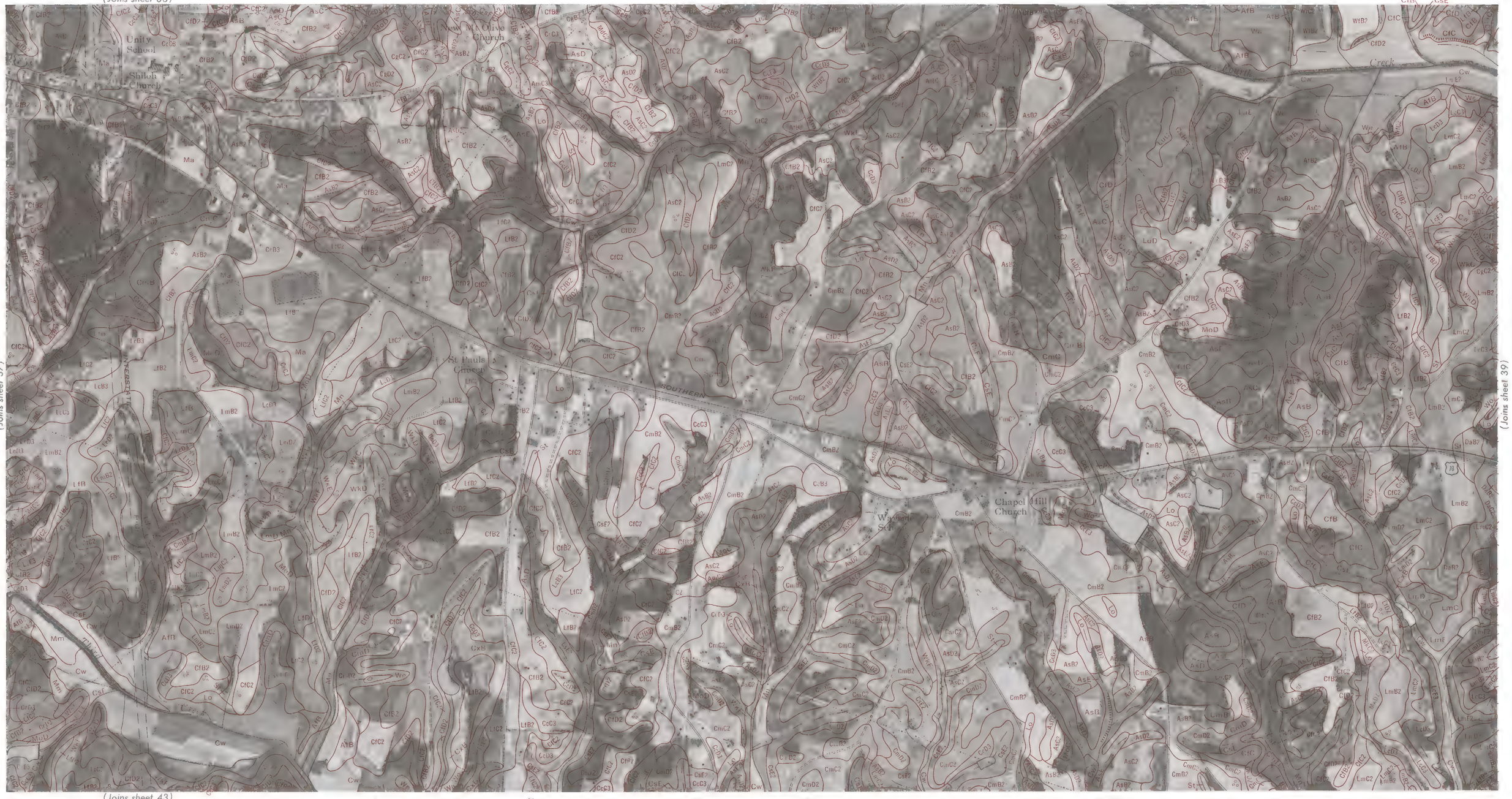
0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

(Joins sheet 33)

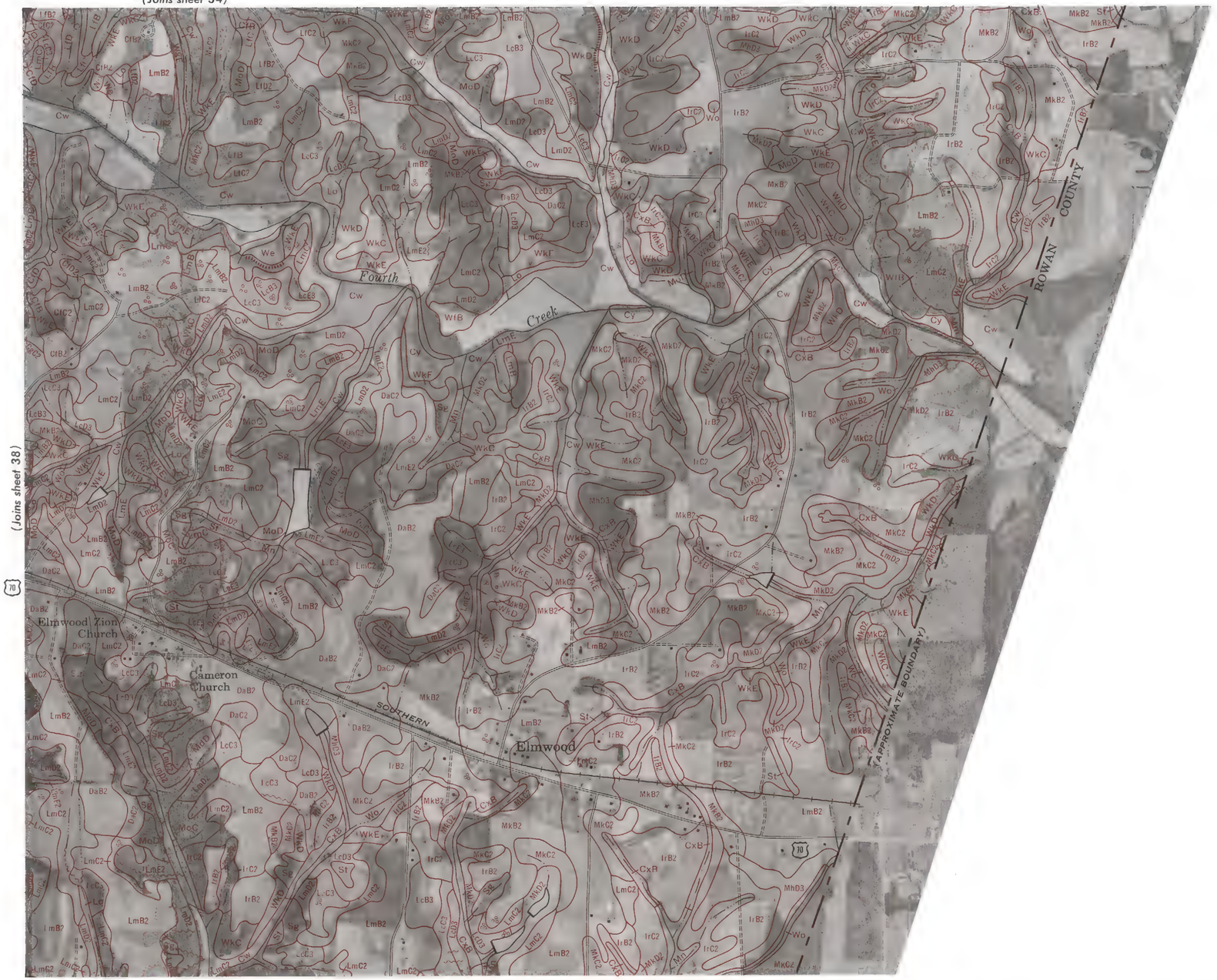
(Joins sheet 37)

(Joins sheet 39)

(Joins sheet 43)



(Joins sheet 34)



0 ½ 1 Mile

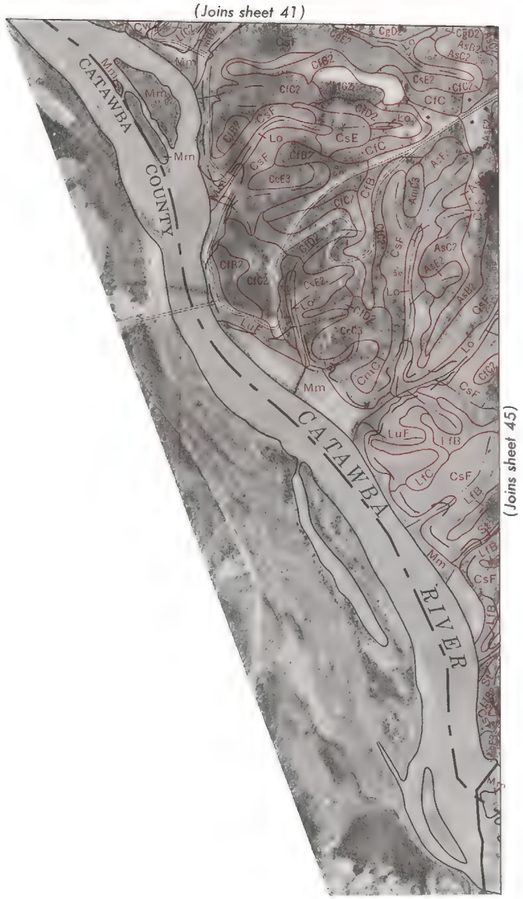
Scale 1:15 840

0 5000 Feet

N

(40)

N

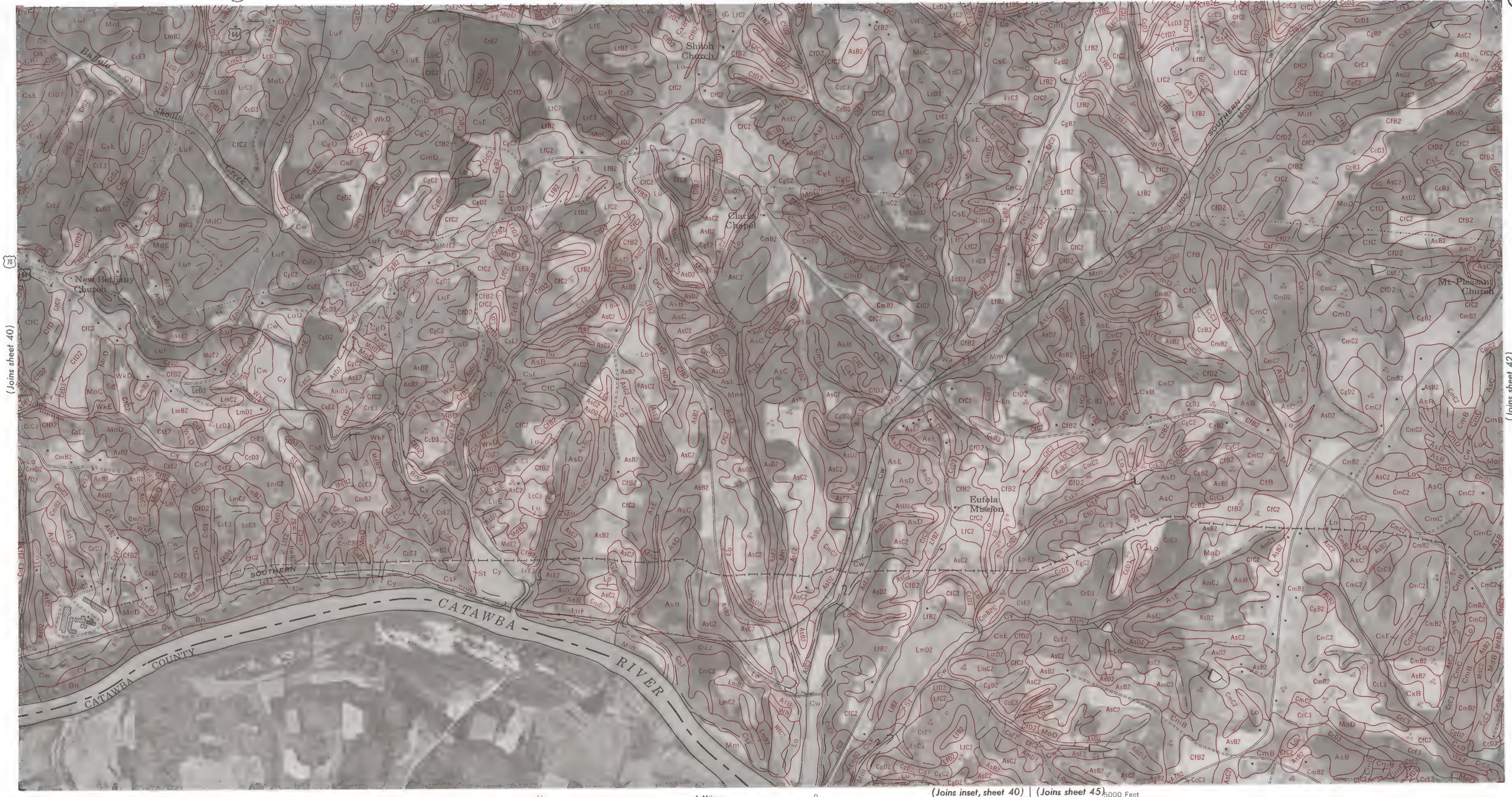


0 ½ 1 Mile

Scale 1:15 840

0 5000 Feet

IREDELL COUNTY, NORTH CAROLINA — SHEET NUMBER 41



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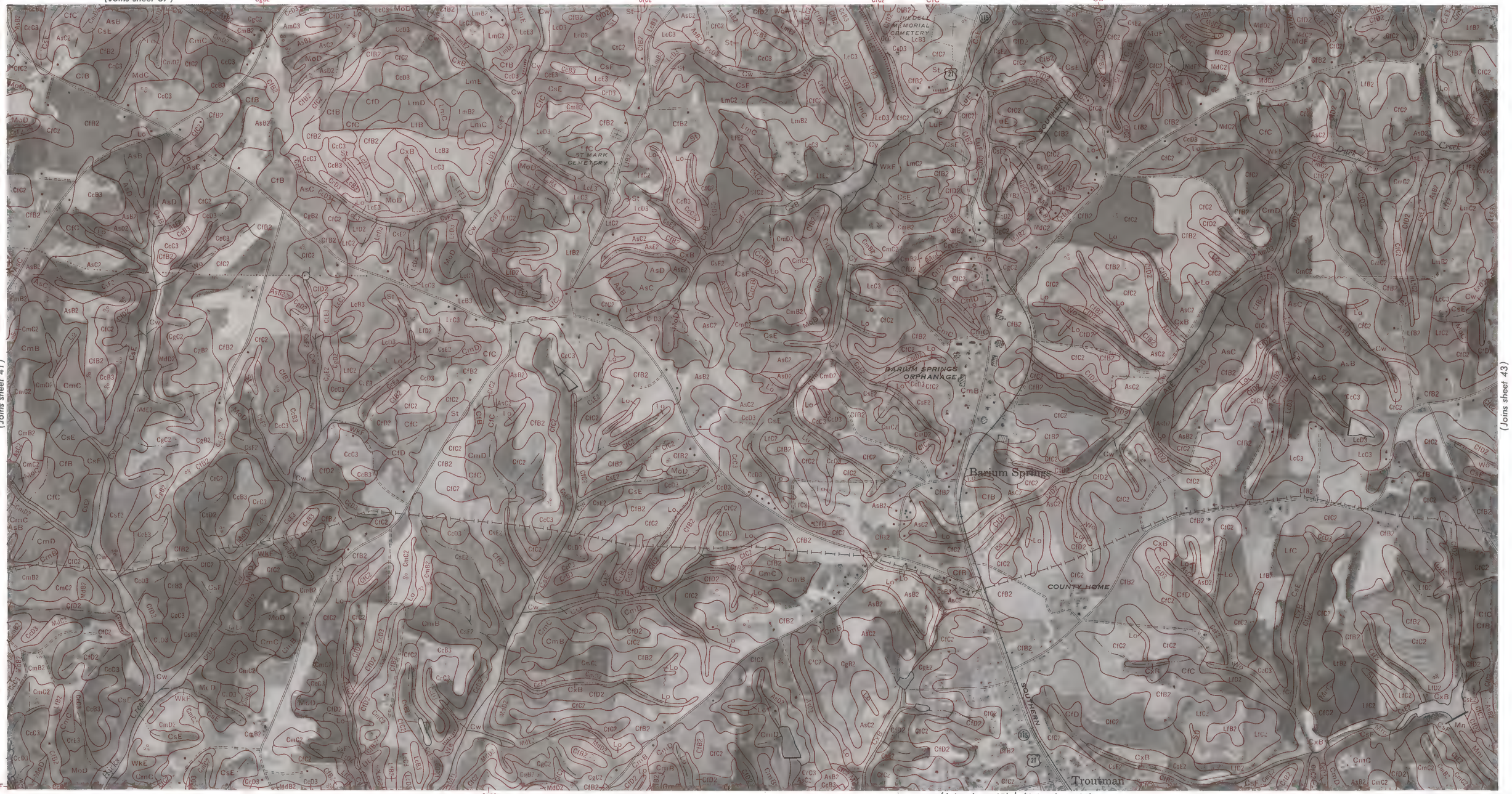
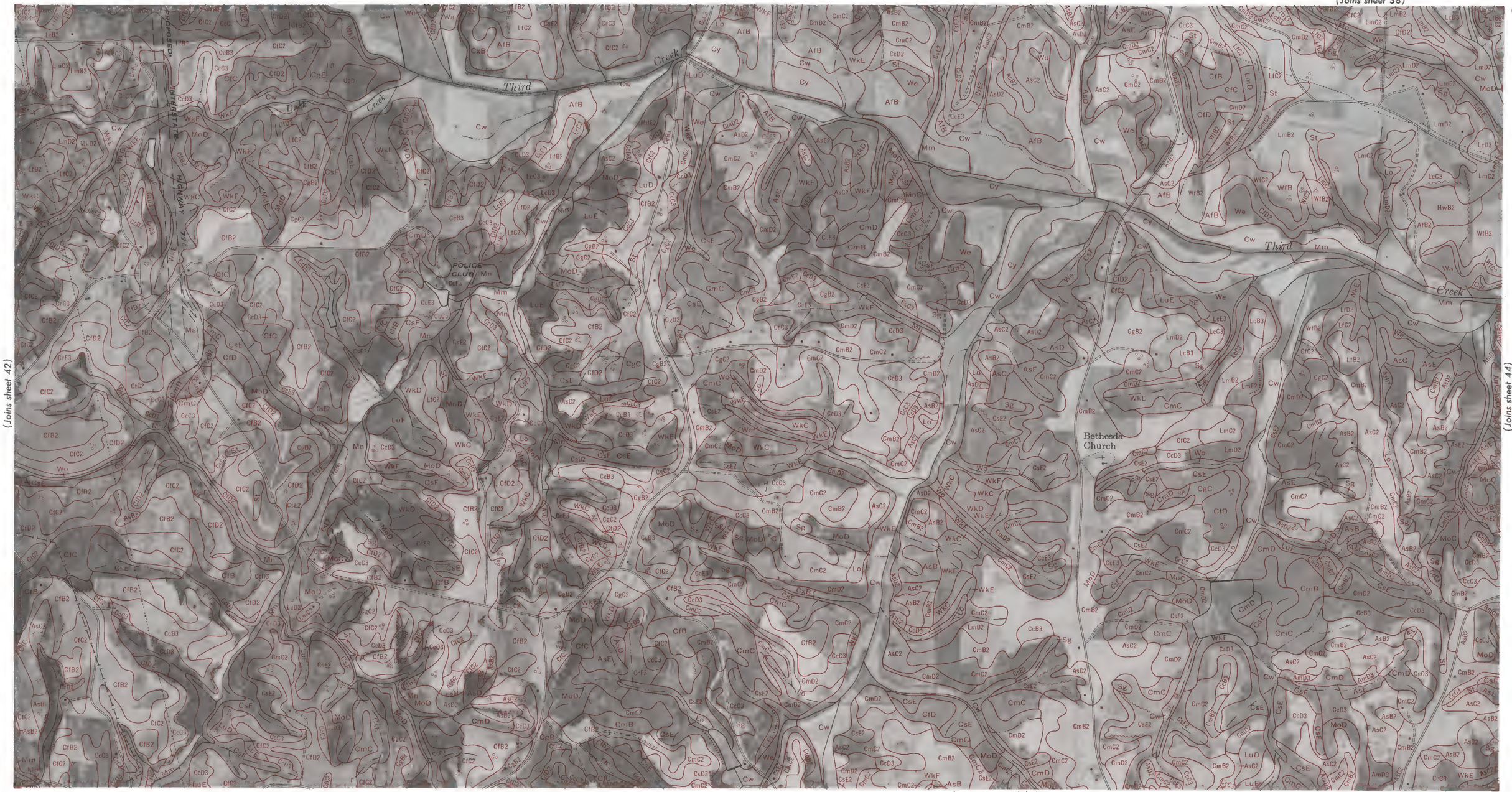


0 ½ 1 Mile

Scale 1:15 840

0 5000 Feet

(Joins sheet 38)



(Joins sheet 42)

(Joins sheet 44)

(Joins sheet 46) | (Joins sheet 47

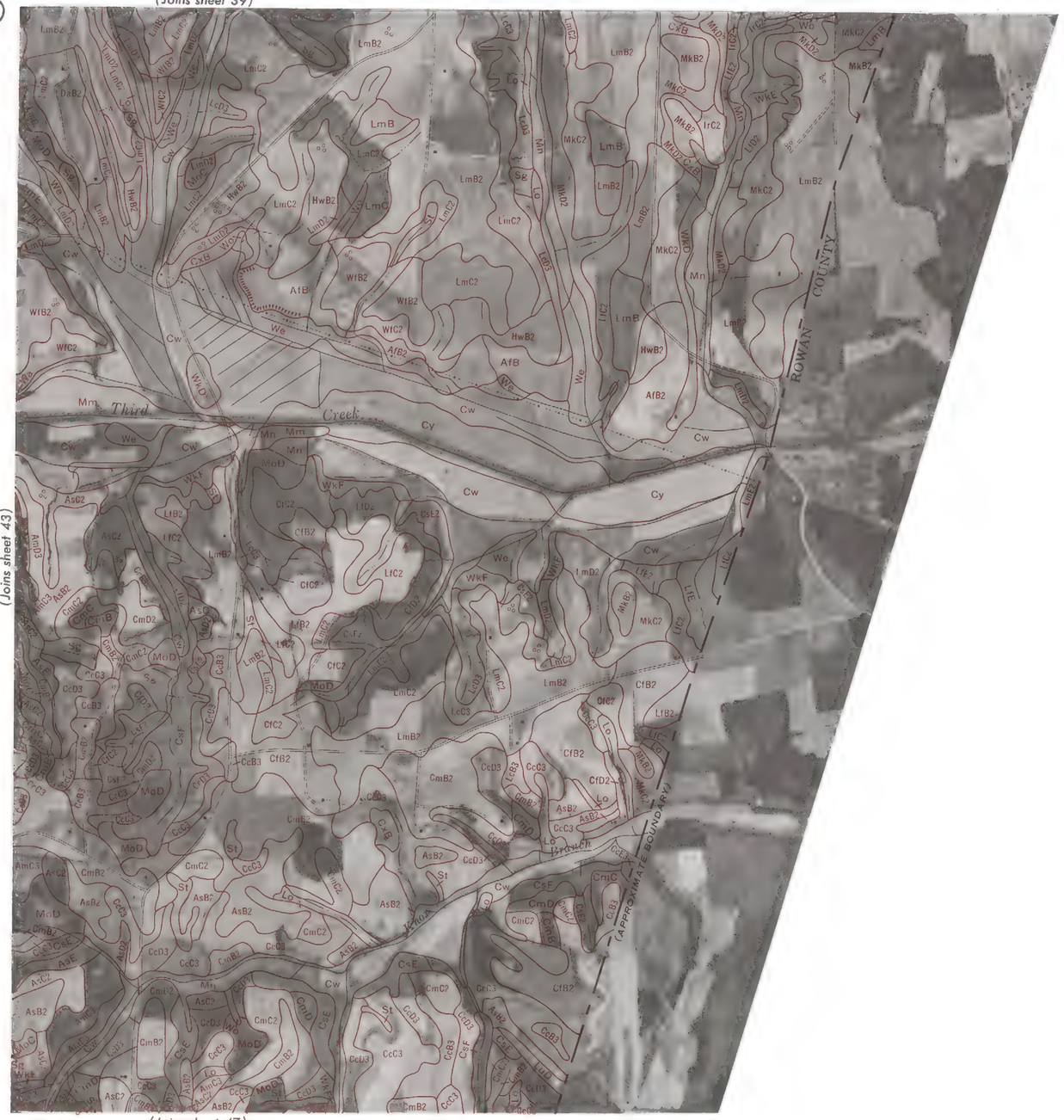
0 ½ 1 Mile

Scale 1:15 840

0 5000 Feet

(44)

(Joins sheet 39)



(Joins sheet 43)

(Joins sheet 47)

0 ½ 1 Mile

Scale 1:15 840

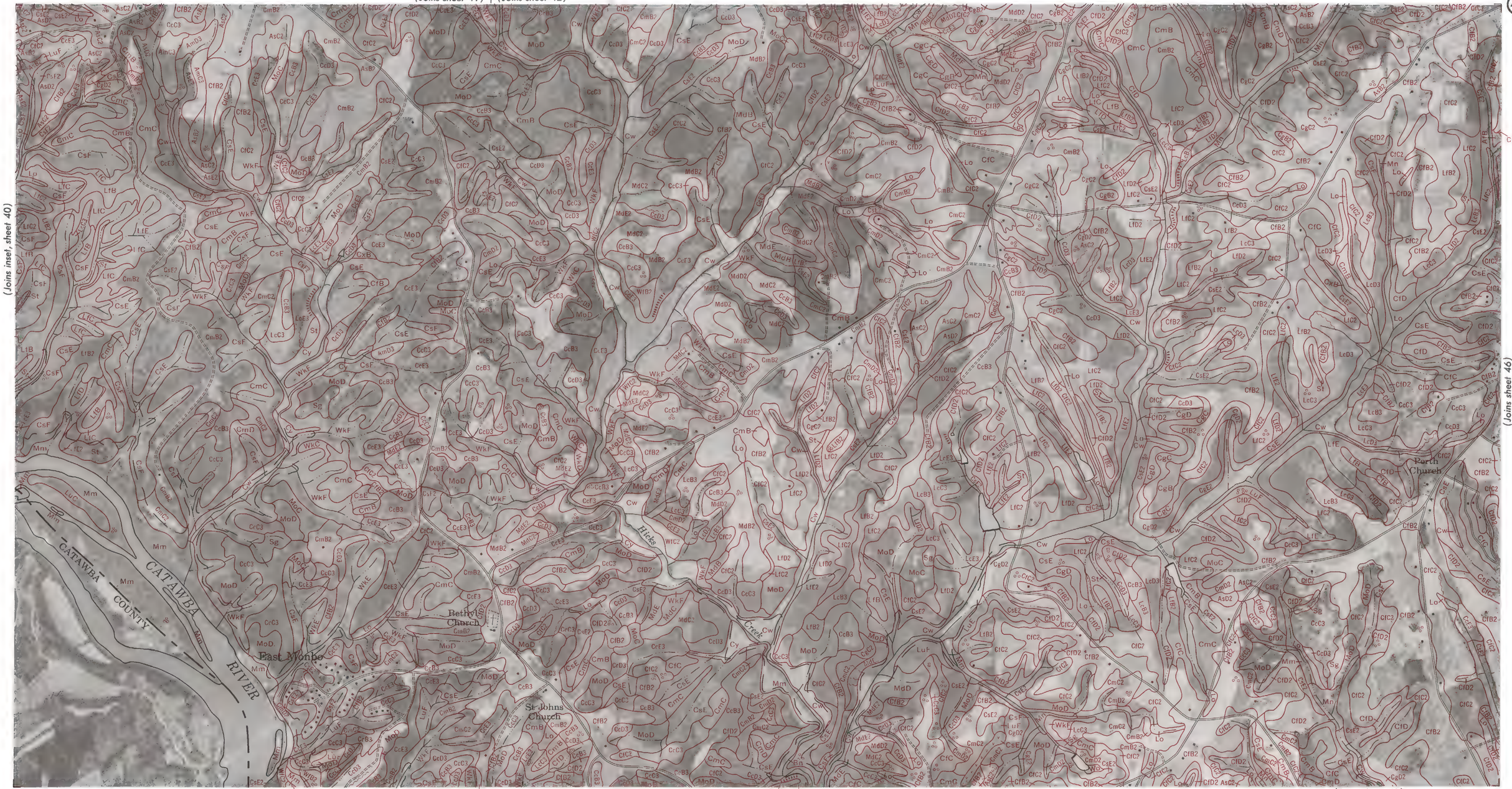
0 5000 Feet

(Joins sheet 41) | (Joins sheet 42)

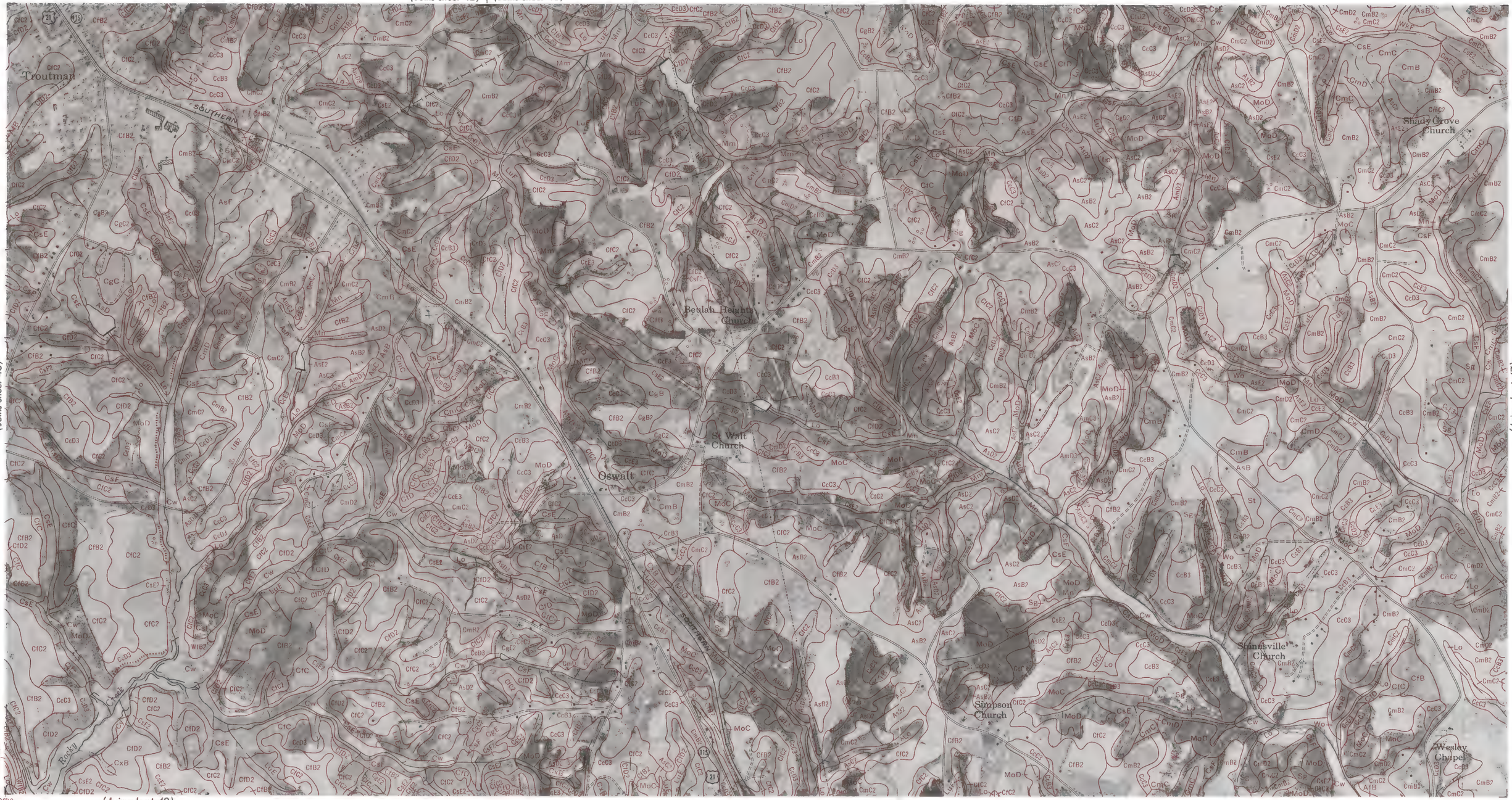
(Joins inset, sheet 40)

(Joins sheet 46)

(Joins sheet 48)



(Joins sheet 42) | (Joins sheet 43)



(Joins sheet 45)

(Joins sheet 47)

(Joins sheet 49)

0 ½ 1 Mile

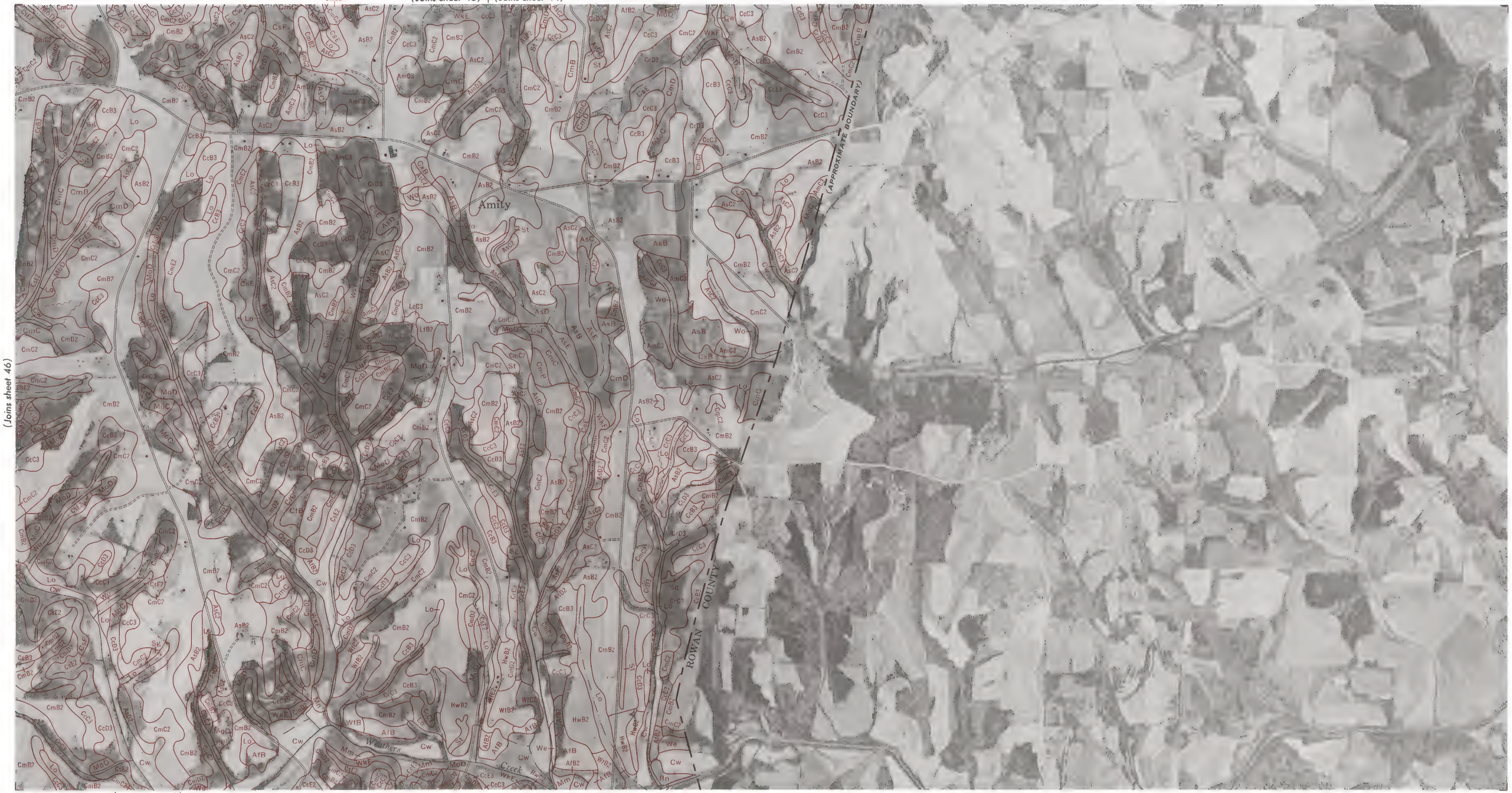
Scale 1:15 840

0 5000 Feet

(Joins sheet 43) | (Joins sheet 44)

(Joins sheet 46)

(Joins sheet 50)

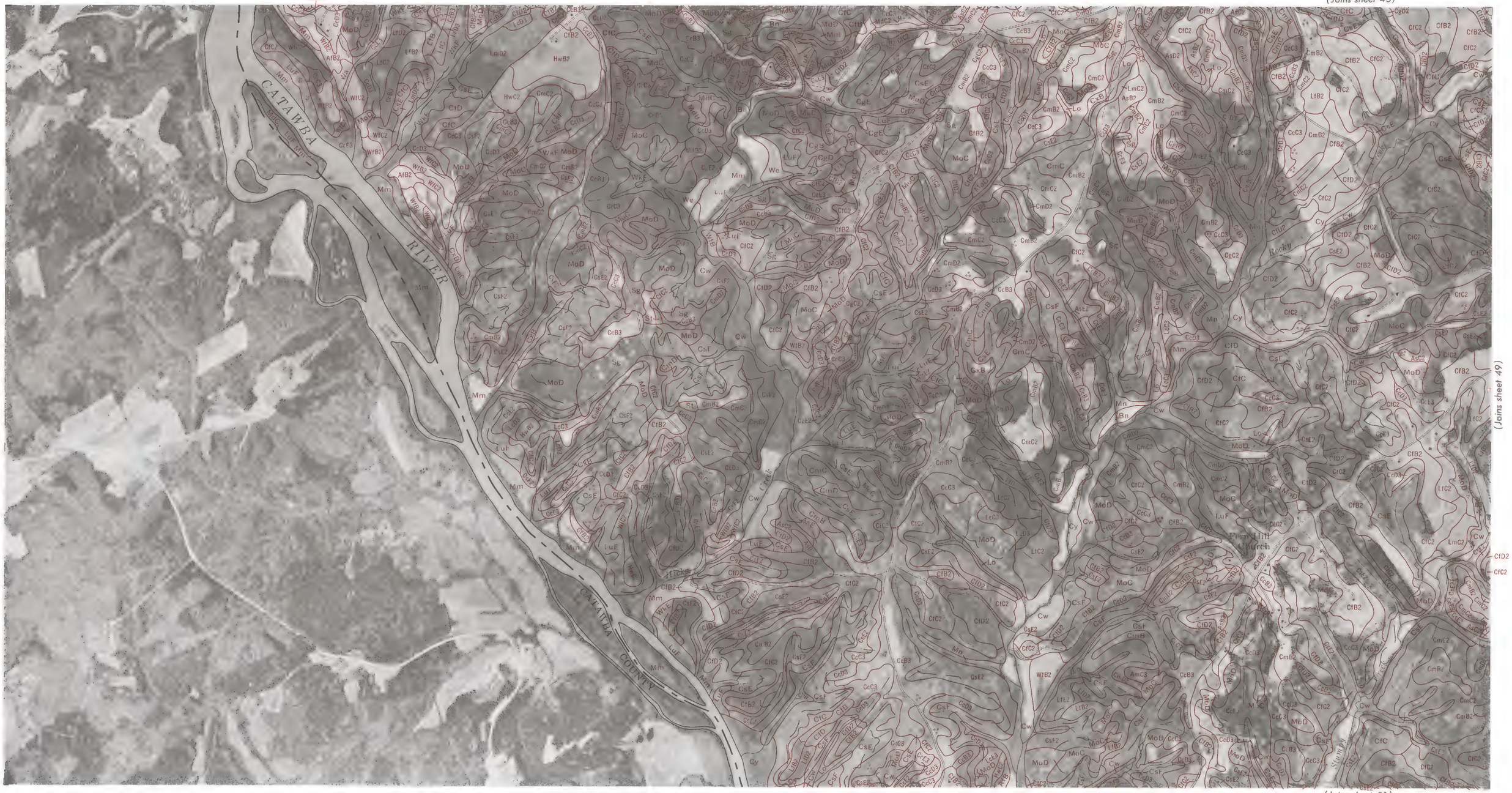


0 ½ 1 Mile

Scale 1:15 840

0 5000 Feet

IREDELL COUNTY, NORTH CAROLINA — SHEET NUMBER 48



(Joins sheet 46)

(Joins sheet 48)

(Joins sheet 50)

(Joins sheet 52)

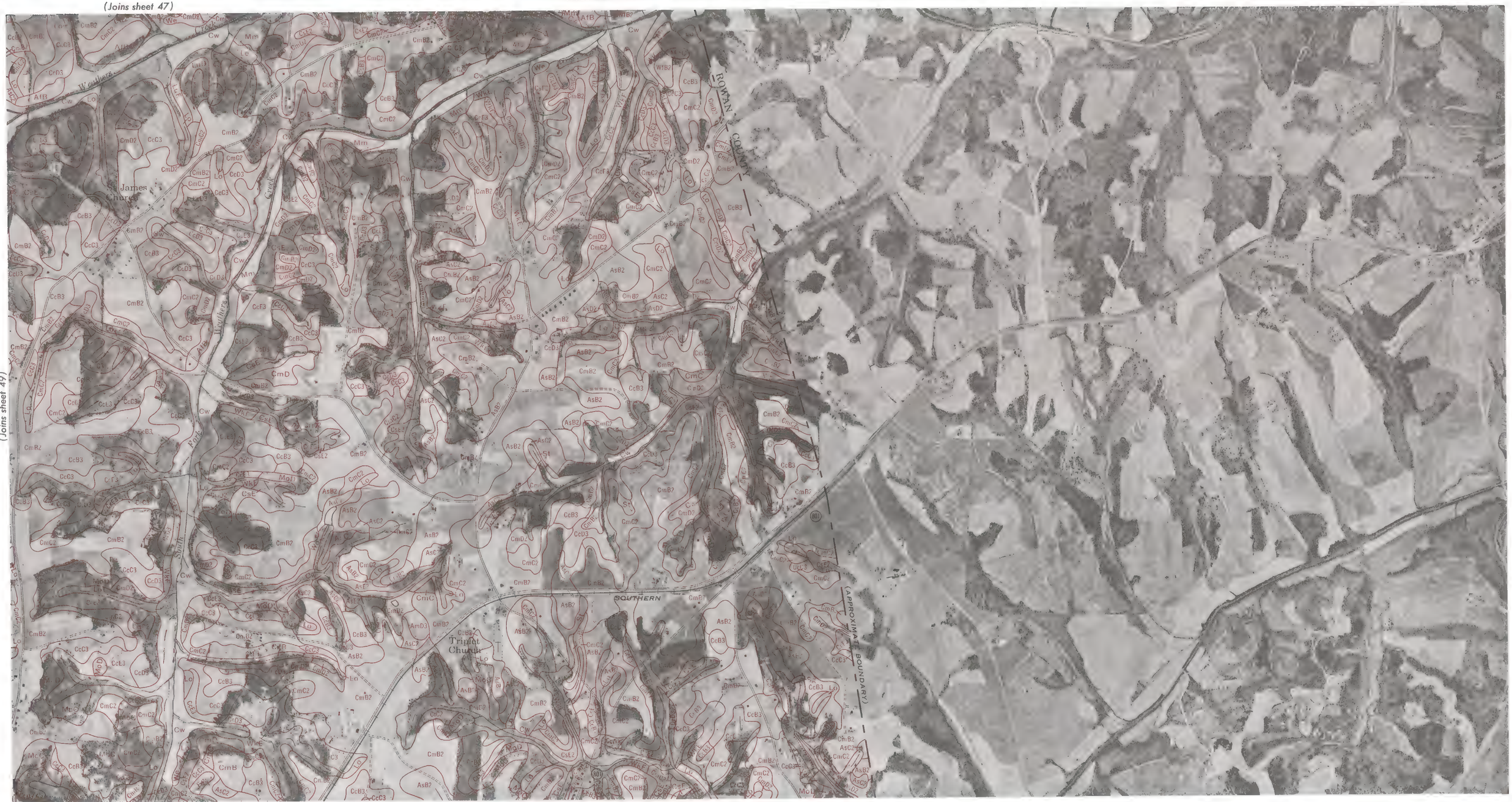
0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

50

N

(Joins sheet 47)

(Joins sheet 49)



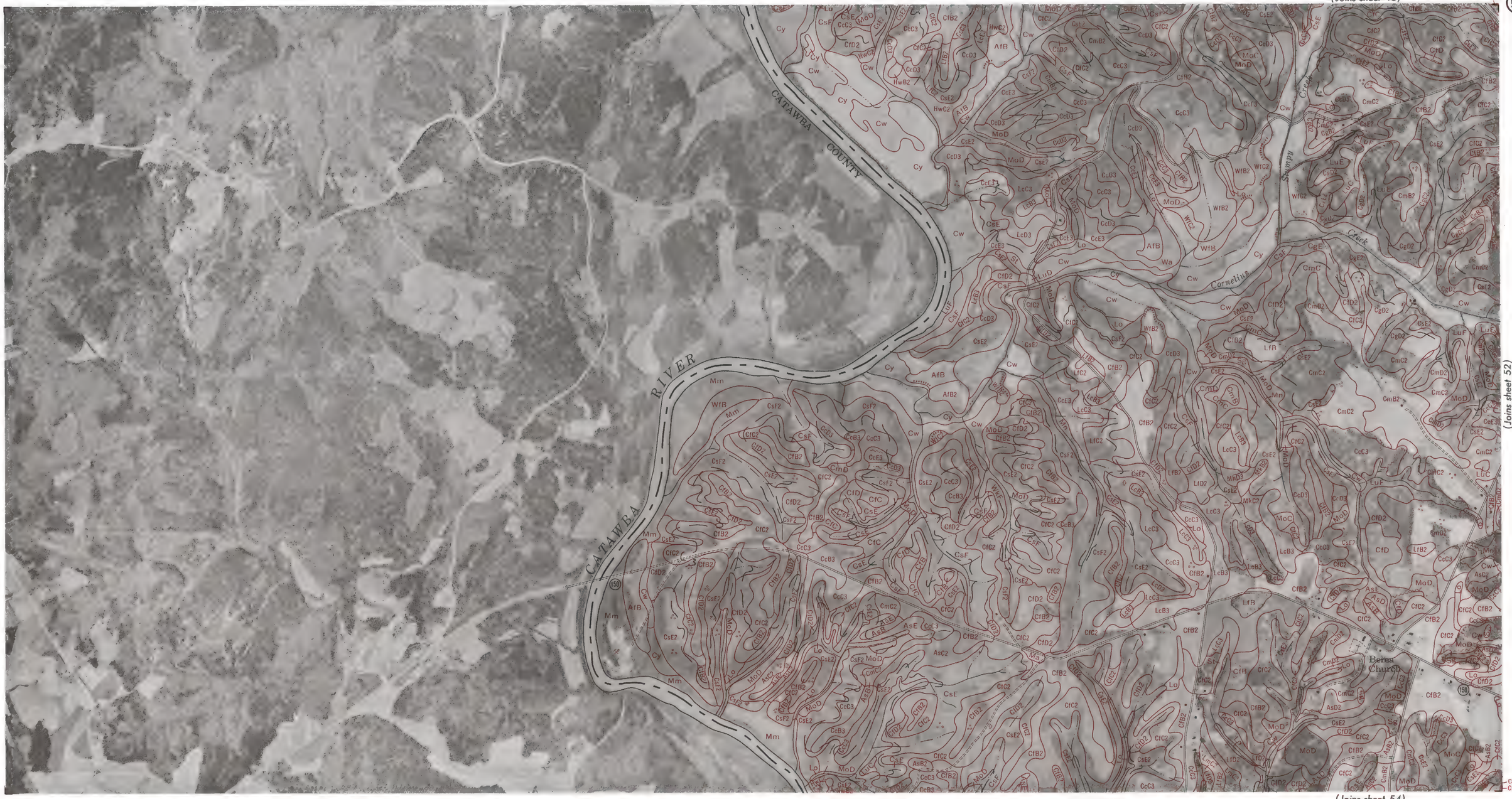
(Joins sheet 53)

0 ½ 1 Mile

Scale 1:15 840

0 5000 Feet

IREDELL COUNTY, NORTH CAROLINA — SHEET NUMBER 51



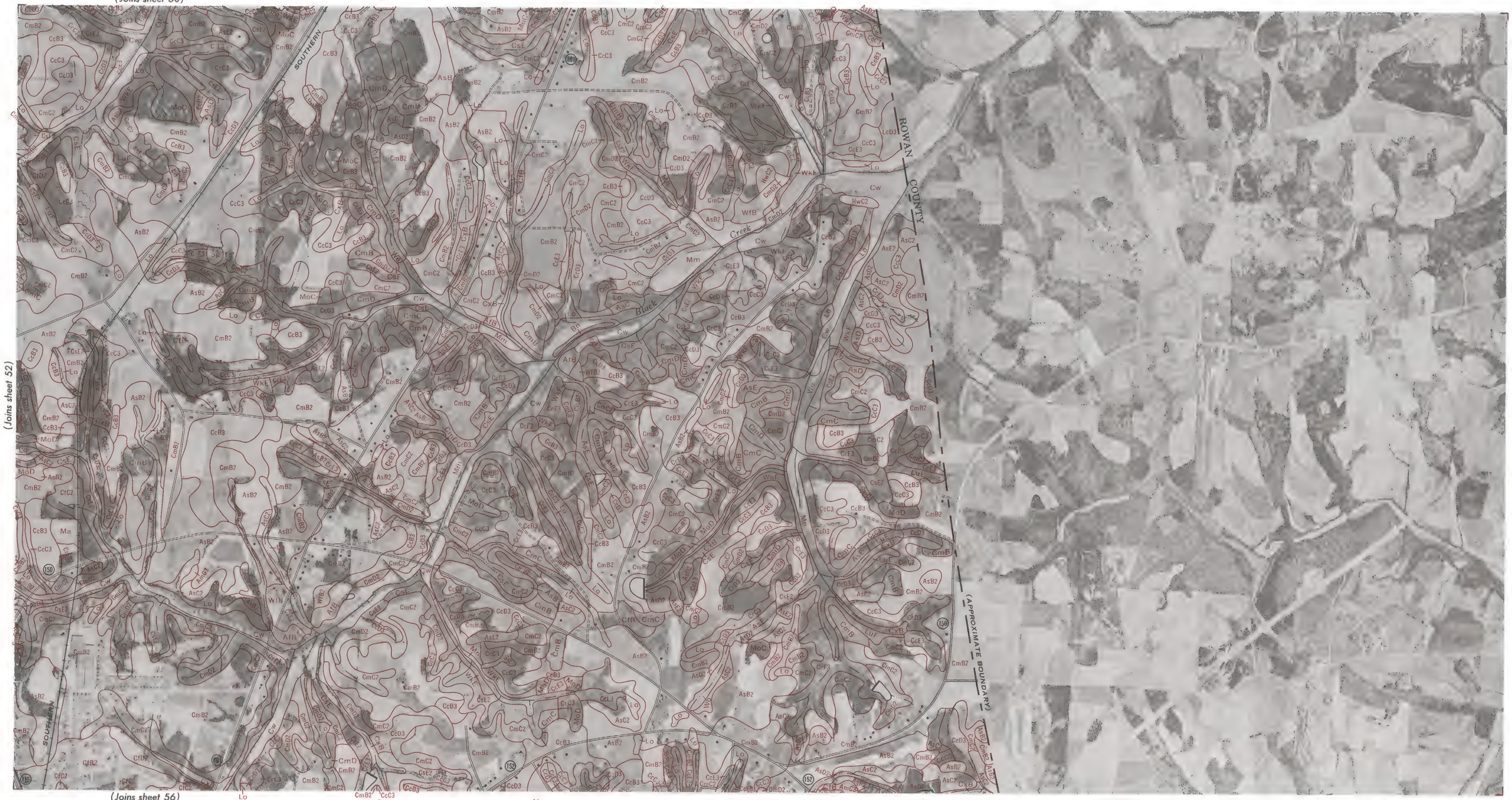
0 ½ 1 Mile Scale 1:15 840 0 5000 Feet


52
(Joins sheet 49)
N
(Joins sheet 51)
(Joins sheet 53)
(Joins sheet 55)
Cornelius
Fairview Church
SOUTHERN
SOUTHERN
0 ½ 1 Mile
Scale 1:15 840
0 5000 Feet

(Joins sheet 50)

(Joins sheet 52)

(Joins sheet 56)



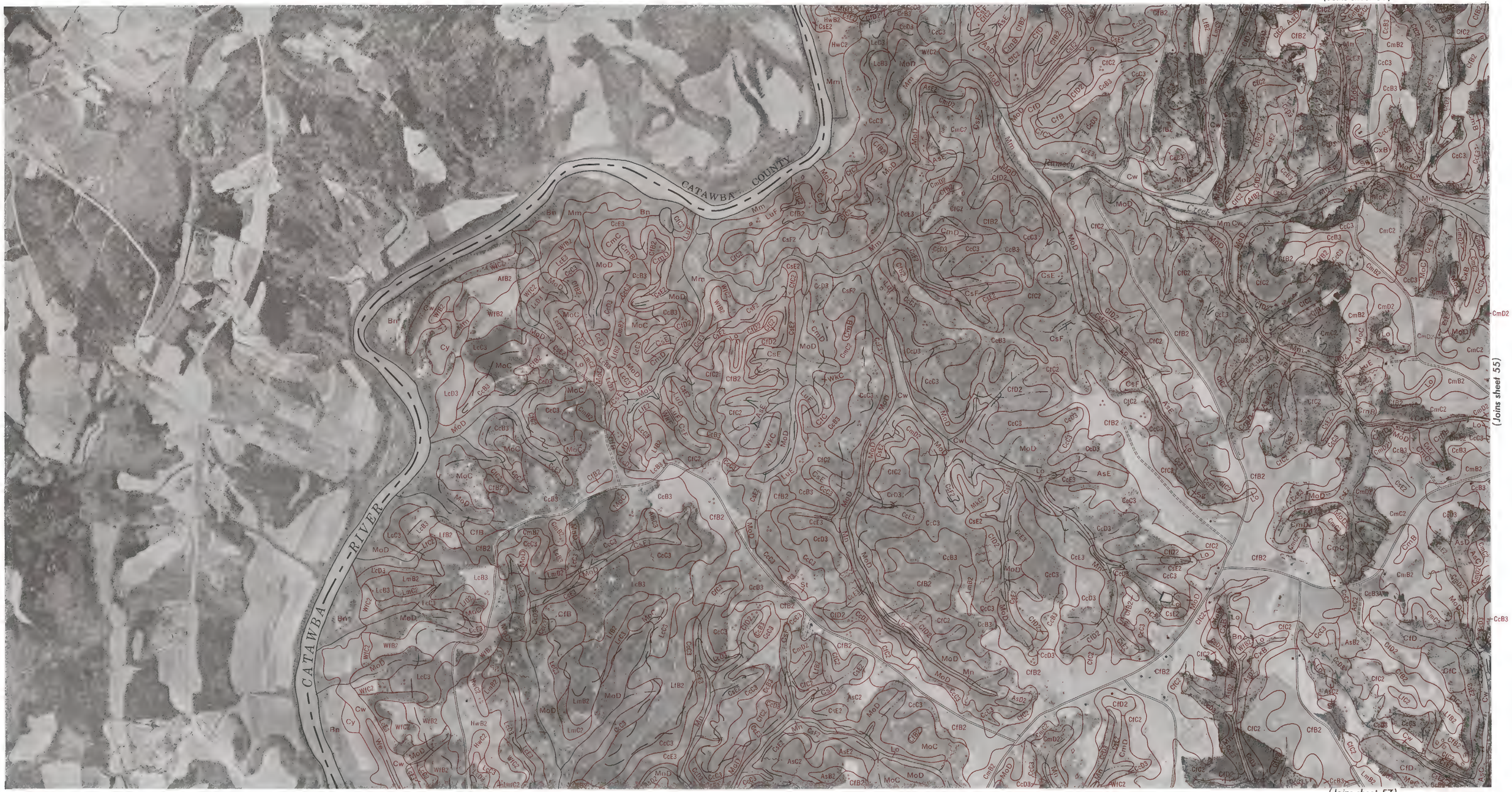
0 ½ 1 Mile

Scale 1:15 840

0 5000 Feet

54

N


CATAWBA COUNTY
CATAWBA RIVER
Ramsey Creek
(Joins sheet 51)
(Joins sheet 55)
(Joins sheet 57)
CmD2
CcB3
0
½
1 Mile
Scale 1:15 840
0
5000 Feet

(Joins sheet 52)

(Joins sheet 54)

(Joins sheet 56)

(Joins sheet 58)

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

(56)

(Joins sheet 53)

(Joins sheet 55)

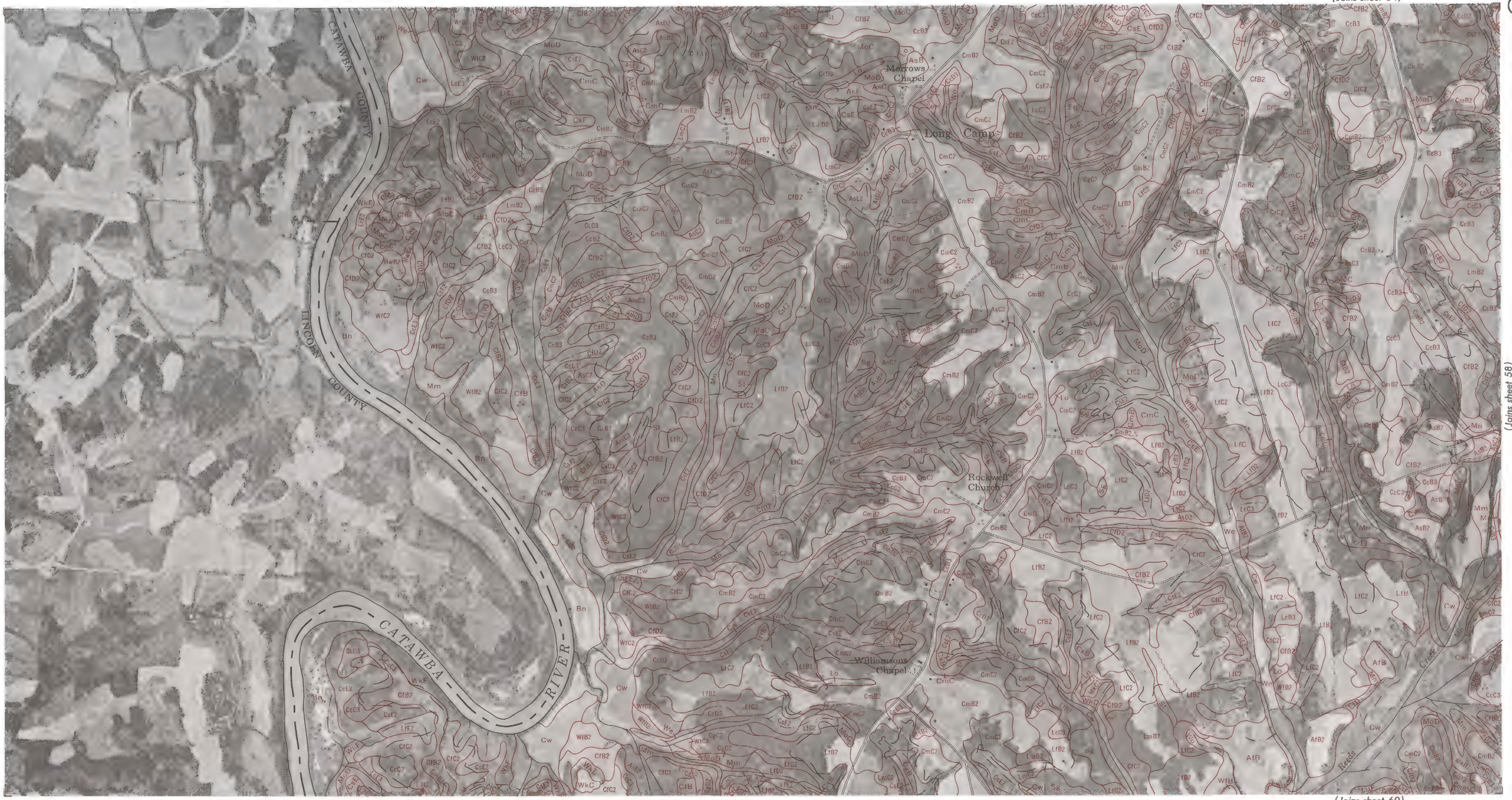
(Joins sheet 59)

0 ½ 1 Mile

Scale 1:15 840

0 5000 Feet

(Joins sheet 54)



(Joins sheet 58)

(Joins sheet 60)

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

(58)

(Joins sheet 55)

(Joins sheet 57)

(Joins sheet 59)

(Joins sheet 61)

0 ½ 1 Mile

Scale 1:15 840

0 5000 Feet

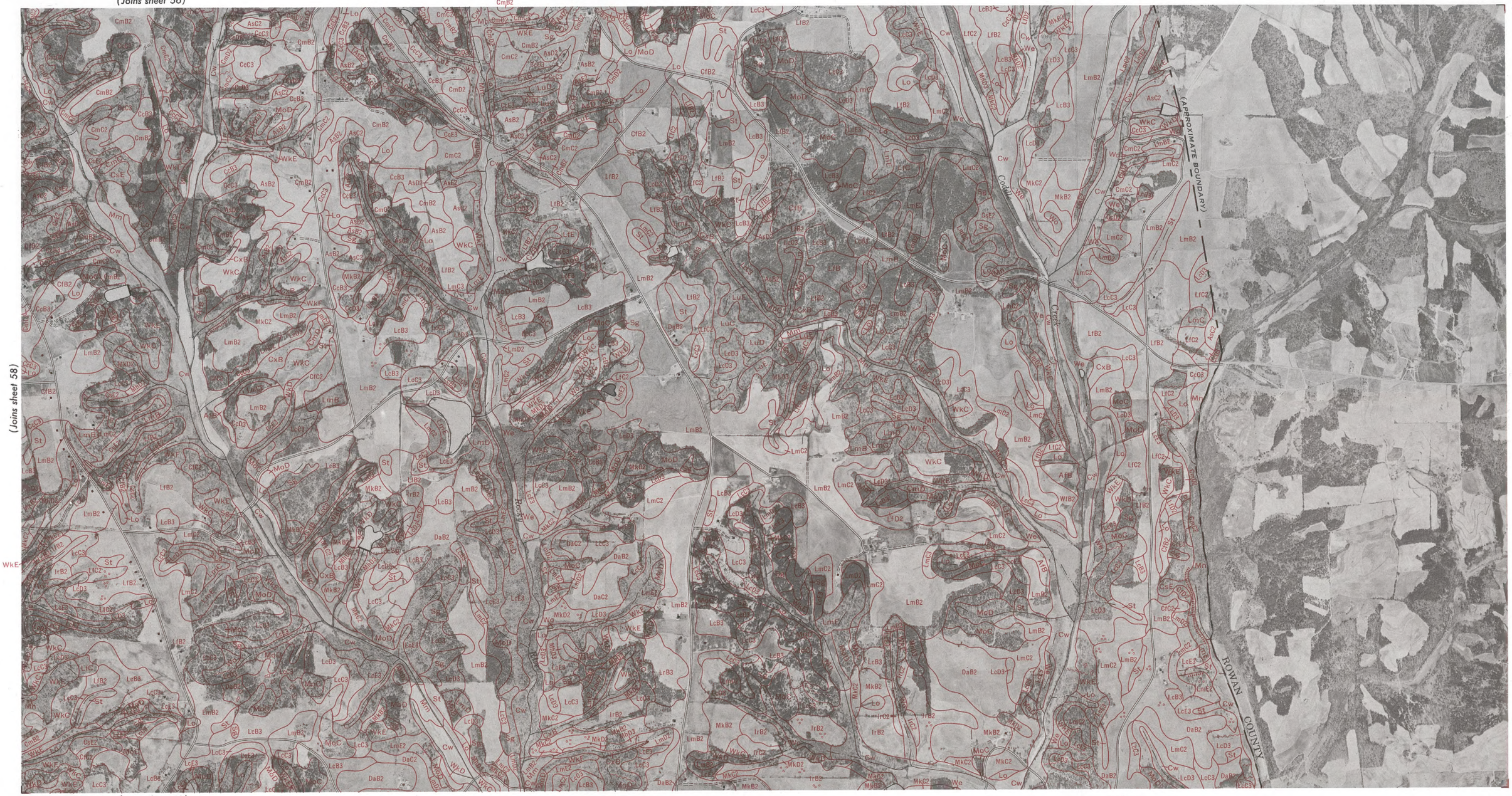
IREDELL COUNTY, NORTH CAROLINA — SHEET NUMBER 59

59

(Joins sheet 56)

(Joins sheet 58)

(Joins sheet 62)

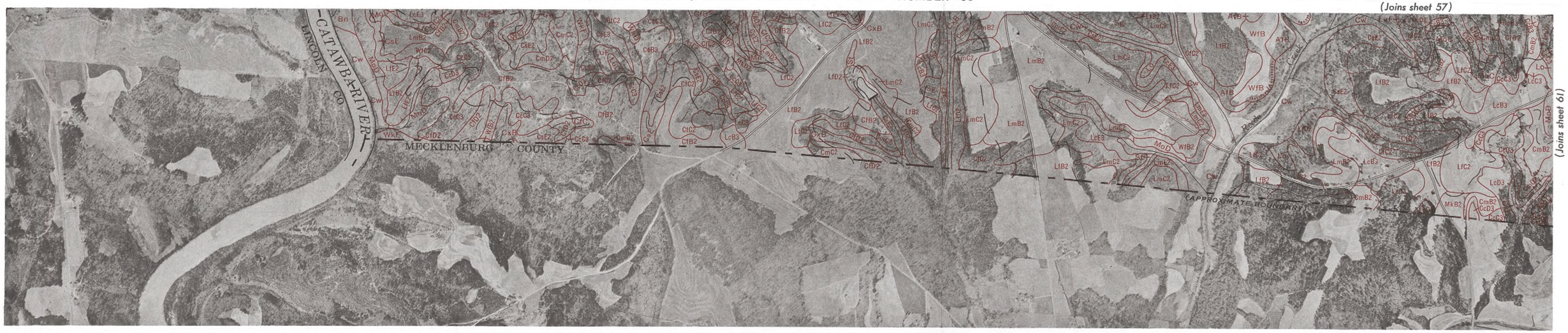


0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

60

N

(Joins sheet 57)



(Joins sheet 61)

0 ½ 1 Mile

Scale 1:15 840

0 5000 Feet

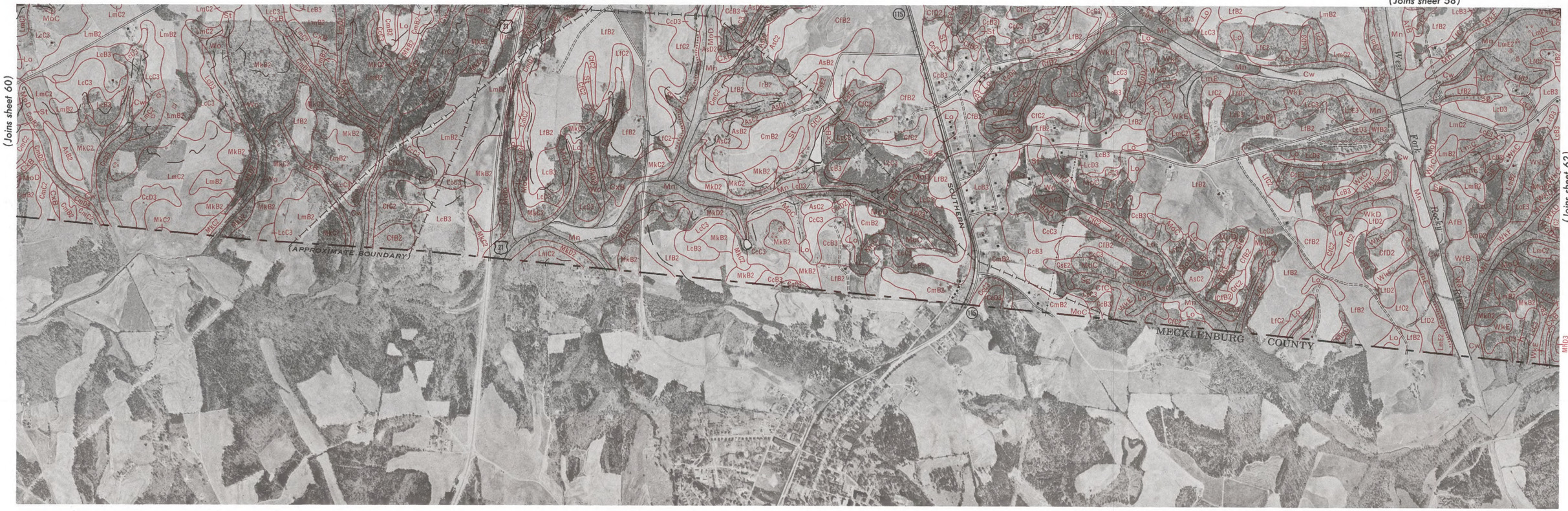
IREDELL COUNTY, NORTH CAROLINA — SHEET NUMBER 61

(Joins sheet 58)

(Joins sheet 60)

(Joins sheet 62)

61



0 ½ 1 Mile

Scale 1:15 840

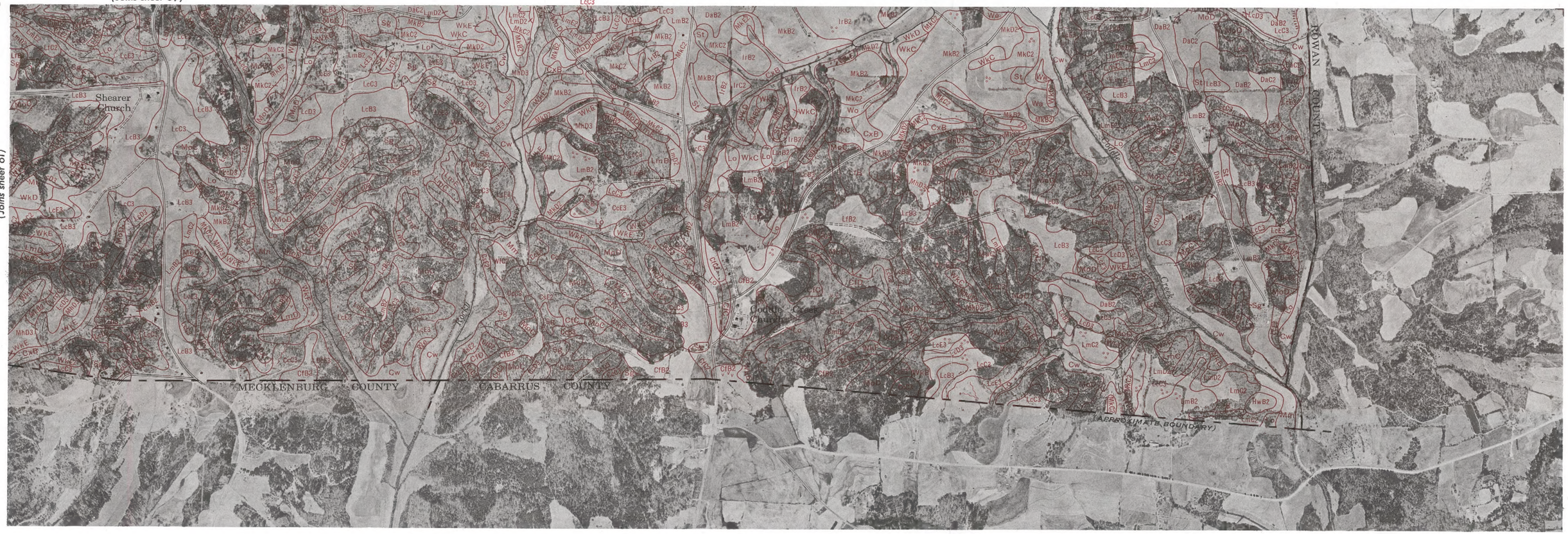
0 5000 Feet

IREDELL COUNTY, NORTH CAROLINA — SHEET NUMBER 62

(Joins sheet 59)

(Joins sheet 61)

N



0 ½ 1 Mile

Scale 1:15 840

0 5000 Feet